

EXCLUSIVE! TAMAYA'S NEW MADCAP

June 1990

# Radio Control CAR ACTION

THE WORLD'S PREMIER R/C CAR MAGAZINE

USA \$3.50

Canada \$3.95

## CAR OF THE YEAR

T E A M L O S I J R - X 2

HIGH-OCTANE  
RC10

KILLER  
KO CX-III

TRAXXAS  
BULLET



**NEW!**  
HOME-BUILT  
PROJECTS

TEKIN'S  
REFLEX  
CHARGER

AYATOLLAH'S PRODUCTION  
UNVEILED





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June 1990



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# EDITORIAL

by RICH HEMSTREET

**W**ELCOME TO OUR 1990 *Car of the Year* issue. This is the third consecutive year that we've chosen a *Car Action* Car of the Year. In 1988, our readers sent in ballots to determine the first winner; they chose Associated's RC10. The following year, we changed the format, and the *Car Action* staff chose the winning car—the Kyosho Turbo Optima Mid SE. This year, after carefully surveying the candidates, we were surprised to find that we actually agreed on our choice after the first ballot. Our decision was unanimous: Team Losi's JR-X2 wins *Car Action's* 1990 Car of the Year award.

This month, we also unveil a new feature, our "Home-Built Project" series, in which cars and trucks will be chosen from the best of the "Readers' Rides" entries. We have these hot cars sent to our office, so one of our topnotch staff photographers can do a full-color photo session. The art department then lays out a spread that does justice to the effort the owner has put into his or her pride and joy.

In our Track Reports this month, three 2WD off-road vehicles are put through their paces. Lou Andreko gives the Traxxas Bullet a going over; Mike Lee puts the Kyosho Turbo Raider on the track for its test; and last, but certainly not least, Bill O'Brien gets his hands on Tamiya's brand-new Madcap.

Steve Pond and Wally David stopped racing long enough to report on several new products they've been using: the Tekin Reflex Charger, the Twister Commutator Lathe and the Monolithic 35Q Power Supply. These products are aimed at serious racers rather than backyard blitzers, and each one could offer the edge racers are looking for.

Speaking of racing, this month we have two indoor race reports. The K/N Winterblast in Stafford Springs, CT, featured 1/10-scale cars on a high-banked carpet oval track, and the GR Winterchamps in Grand Rapids, MI, had 1/12-scale cars racing on a temporary carpet roadcourse. Remember, R/C racing doesn't require a multi-million-dollar racetrack with gobs of sunshine; the tight little carpet tracks found throughout the northern states provide competition as fierce as you'll find anywhere in the country.

We welcome a new author this month: Dave Hudson provides an alternative to the battery wars with his High-Octane RC10. Dave's innovative car features an Associated RC10 front end bolted to a Kyosho gas-powered Assault rear end. This nitro-burner might not be the fastest 1/10-scale off-roader on the track, but it runs for 15 to 20 minutes without dumping.

As we head into the summer, R/C activity is heating up all over the country. Every week, I receive phone calls and letters about new tracks that are being planned or are already built. The key to success for these tracks will be how well they promote their weekly racing events; a single, large, national event won't keep them running for very long. Besides, the national schedule is filling up so fast that few good dates are still open.

For many lucky racers, however, the days of sweeping a parking lot and setting up boards before starting a day of racing are behind them, as new track owners come forward with permanent facilities. Be sure to support your local track owners, and do all you can to promote their efforts to keep R/C racing growing. Until next time, keep it off the wall and take it easy on the turn marshalls!



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# LETTERS

We welcome your comments and suggestions. Letters should be addressed to "Letters," *Radio Control Car Action*, 251 Danbury Road, Wilton, CT 06897. Letters may be edited for clarity and brevity. We regret that, owing to the tremendous numbers of letters we receive, we cannot respond to every one.

## BLACK & DECKER BATTERY PACKS?

I have a battery question: I've been using a Turbocharger to cycle, match and maintain my batteries. When my cordless drill died, I noticed that its batteries were sub-C cells. What's the difference between these cells and the SC, SCR and SCE cells used in R/C battery packs? Can I use a Turbocharger on these cells?; and can I use this type of cell in an R/C car? I don't think so, but please let me know.

RICK LASKEY  
Derby, KS

*Rick, you're right, they're sub-C cells. SC, SCR and SCE cells are made by Sanyo, and they're handled according to current battery-charging philosophies. Because I don't know the brand of the cells in your cordless drill, I really don't recommend that you use an R/C charger, so they probably wouldn't be much use for racing.*

*The good news is that you can use old car cells in your drill and other cordless tools. You may even notice an increase in performance, although the duration between charges may not be the same.*

WD

## IN SEARCH OF THE SILENT ROAR

With regard to Rick Jordan's letter in the March '90 issue, ROAR should take a

look at everything that's going on! I'm a small-town racer; there's no glamour, no glory, no publicity and no sponsorships, but our numbers *are* growing. If national races are based on ROAR rules, ROAR should contact the small-town racers, too!

I joined ROAR in 1989, received my card, my "Rev-Up" (nothing but ads), but no rules. When I called ROAR, I heard only an answering machine. When I wrote to ROAR, I never heard from them. We can't all afford modified motors, peak chargers and SCE packs, so we race mainly stock motors to keep costs down. Why can't ROAR and the motor companies work together? Maybe they could have a standard color for stock motors and a standard color for advanced, timed, stock motors with manufacturers' decals

# MAXTRAX™

## Takes Your Trucking to the Max

### We know R/C trucking.

Only **MaxTrax** offers heavy-duty hop-up parts, such as steel gears, drive hubs, and aluminum shock towers, to replace the plastic pieces included in truck kits.

Only **MaxTrax** has the official pulling sled of the National Radio Control Truck Pulling Association. Scale in size and appearance, the **Eliminator** is built for the most demanding uses in pulling competition. It features a sturdy one-piece extruded aluminum frame (able to support up to 400 pounds), tandem axle drive with 1/4" diameter hardened steel axles, roller chain drive system, adjustable drive chain tension, bronze oilite bushings, solid rubber tires, and anodized aluminum wheels. With high-tech anodized finish and attractive striping and decals, the Eliminator looks as great as it performs.

### A chassis with proven pulling advantages.

The **MaxTrax Wedge** 2WD puller chassis kit is specifically engineered for R/C pulling. Its wheelbase is adjustable from 11 1/2" to 15 1/2" to let you find the best weight distribution for any surface. The steel-framed rolling chassis, pictured below with Chevy puller body, has already proven its mettle by taking one of the top spots in the 2WD Open I Class at the NR/CTPA World Championships.

MaxTrax specializes in R/C trucks, and trucks alone. To get the most performance from yours, take it to the Max—Hobbico MaxTrax.





over the tabs. Companies should remember us, too, not just try to win a world championship.

I can't criticize ROAR rules, because I don't know what they are. R/C racing, like any other racing, should have simple rules. In my opinion, in small-town stock-class races, if you're not cheating, you're not winning. Wouldn't it be nice if everyone could afford 50mph modified racing?; then, we'd need rules. Perhaps *Car Action* could publish some basic rules?

BART SWENSON  
Watertown, SD

Thanks for writing, Bart. I think you're right; ROAR should get its act together—and soon. Local racers are the life of our sport, but their problems are seldom ad-

*dressed by ROAR. Disposable stock motors are a major problem that's driving the cost of racing through the roof. The advanced-timing motors are so amp-hungry that, at many tracks, they force racers to run SCE batteries to be competitive in the stock class.*

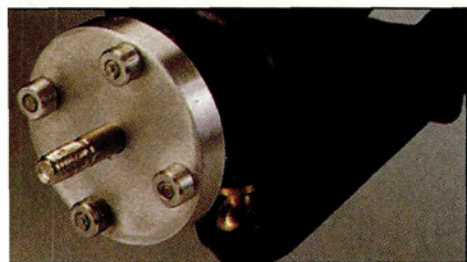
*Many local clubs have used handout stock motors to combat skyrocketing motor expenses. If your club representative contacts several motor manufacturers, you should be able to find one who can supply 27-turn motors with 20 degrees of timing, or less. If all things are equal, the lower the timing, the longer the motor will last. Once the club has the motors, members can seal the end bells with tape, a decal, or colored epoxy. Somehow, make sure that the end bell can't be removed*

*without showing obvious external signs of tampering. By using a 27-turn motor with less timing than that of the current hot stock motors, you'll probably be able to run SCR batteries in stock class without losing any advantage to those who use SCE packs.*

*I've been in close contact with some people who are working to start a new organization that would have a realistic approach to helping racers compete, both on local and at national levels. If this new organization becomes a reality, ROAR's ineffective approach will be even more obvious. Meanwhile, keep racing, and don't be afraid to try something new locally, rather than simply following ROAR's lead all the time.*

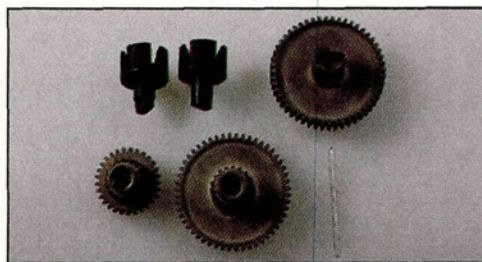
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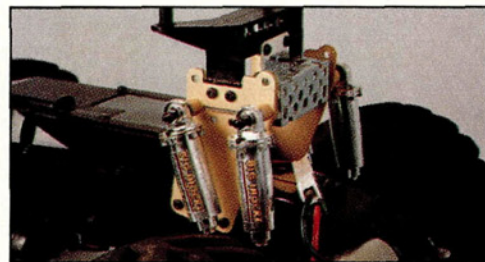
**MTXC0100**  
**HD Aluminum Wheel Hub Set**

must for pulling applications, MaxTrax machined metal drive hubs offer super strong performance for all Kyosho monster trucks. Each package includes two hubs, eight drive pins, and eight hex screws.



**MTXC0500**  
**HD Steel Gear Set-Kyosho**

Recommended for pulling, MaxTrax heavy-duty steel gears fit all Kyosho monster trucks. Included are two universal joints and one final drive gear, idler gear, counter gear, and universal joint guide shaft.



**MTXC0300**  
**HD Aluminum Shock Towers-Rear**  
(shown)

**MTXC0200**  
**HD Aluminum Shock Tower-Front**

Sturdy gold-anodized aluminum MaxTrax front or rear shock towers easily fit Big-Brute, Hi-Rider and Big Boss with little or no modification. Adjust shock and body height with optional mounting holes. Each package includes a pair of shock towers and hardware.



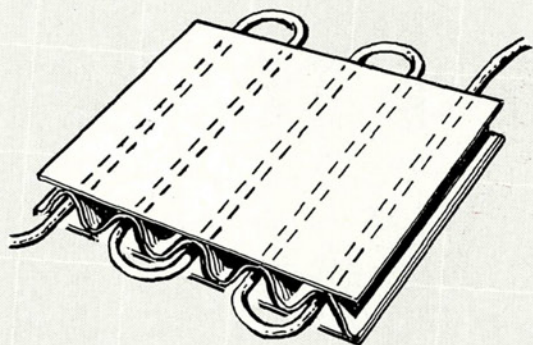
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# PIT TIPS

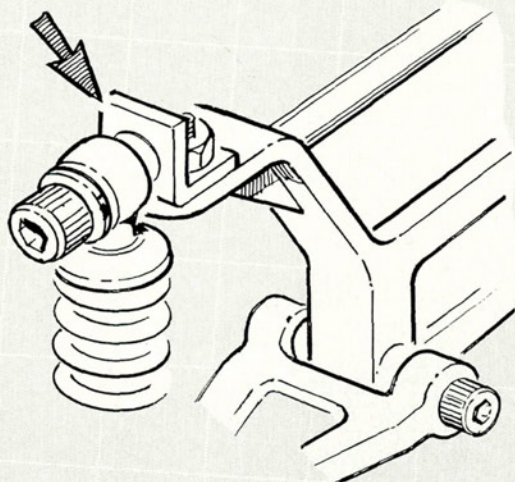
by JIM NEWMAN



## ANTENNA SHORTENING

Do *not* coil your antenna to shorten it, or you'll drastically reduce its range. This simple method is much better. Cut a piece of corrugated card that will fit into your car, then weave the excess antenna wire through alternate flutes or channels in the card.

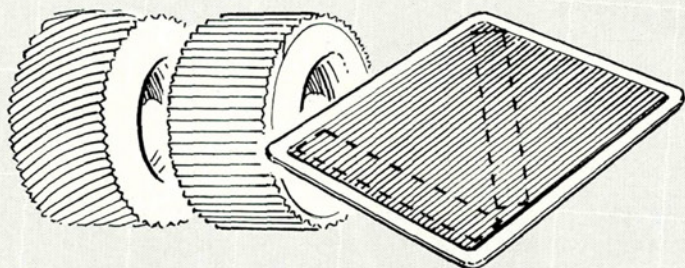
*Hal Nguyen, Fulton, NY*



## SHOCK ADAPTERS

When you change to oil-filled shocks, you'll often need adapter brackets. Tim made these brackets (arrowed) from 1/32-inch-thick aluminum. Bolted to the existing mounts, they allow you to use regular spacers and screws, nuts and washers (which can be inserted sideways).

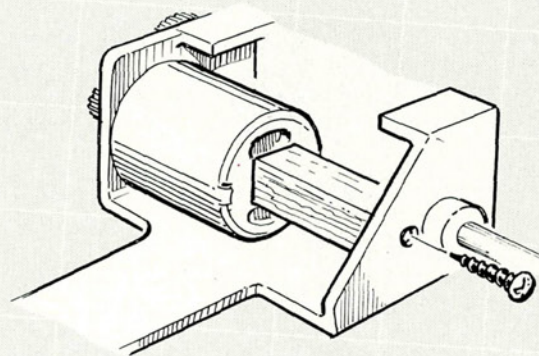
*Tim Brown, Concord, NH*



## LOW-COST RETREAD

These rubber, car floor mats are available from discount stores and come in a variety of tread designs—ribbed, diamond, waffle, knobby, etc. Cut them into strips as shown (dotted), then glue them around your worn-out slicks, using an overlapping, beveled joint and good contact cement. Our contributor paid only \$3.50 for a 12x18-inch mat, which yields approximately 12 retreads. The price is right!

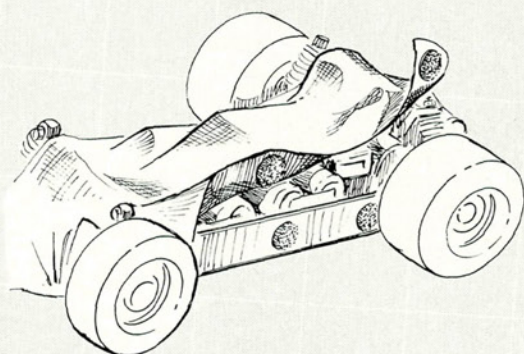
*Jim Beard, Indianapolis, IN*



## END-BELL RETAINER

Louis and his friends experienced a problem that hasn't been discussed in this column: the end bells popped off their 1/10-scale racers when they crashed into barriers. The remedy was simple: they wedged a wooden block between the end bell and the left axle-bearing block and held it with a small wood screw. No further problems so far!

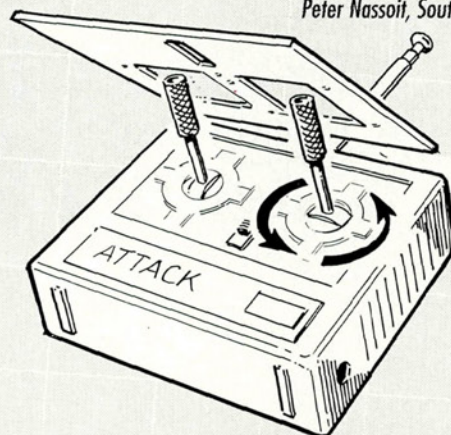
*Louis Jounakos, Massapequa Park, NY*



## HORNET DUST COVER

This piece of fabric, approximately 12x7 inches, is cut to drape over the "works" of the car. Pieces of Velcro along the edges secure it to the chassis sides before the body is put into place. The cover does a good job of keeping out dust on dry tracks. I recommend Rip-Stop nylon or tough Dacron (used for drape linings). If you use an electronic speed controller, be sure you allow air to cool your heat sinks.

*Peter Nassoit, South Bound Brook, NJ*



## SERVO-REVERSING

If you have an older Futaba Attack radio (the one without servo reversing) and you need to "reverse" a servo, try this. Remove the transmitter faceplate, rotate the appropriate stick assembly 180 degrees (one half-turn), then replace the plate. The stick action is now reversed so that you have the effect of a reversed servo.

*Andy Barton, Simpsonville, SC*

(Continued on page 19)



# READERS' RIDES

**W**elcome to Readers' Rides. This is our way of giving recognition to the unique, innovative—and sometimes bizarre—vehicles that our readers have created. If you want to join the growing ranks of Readers' Rides winners, send us a sharp, uncluttered, well-exposed color photo (no Polaroids, please!) of your car or truck, along with a brief description. Who knows? The Ayatollah of Radio Controlla might pick your car.

If your ride is chosen, you'll receive a one-year subscription to Car Action, or we'll extend your existing one. You'll also be eligible for the second annual "Readers' Ride Car of the Year Contest" in the fall of 1990. Send your photos to Readers' Rides, R/C Car Action Magazine, 251 Danbury Rd., Wilton, CT 06897. Be sure to include your address and phone number, in case we need to contact you!

## IVAN THE TERRIBLE

Jay Hollingsworth, of Alexandria, PA, owns this incredible RC10/Toyota Stadium Racer. The many mods on this truck include a custom rear shock mount, rear body mount, lightened chassis and dual front shock mount. After-market parts could make it even more unusual! Its incredible quality would make even Iv "Ironman" Stewart proud.

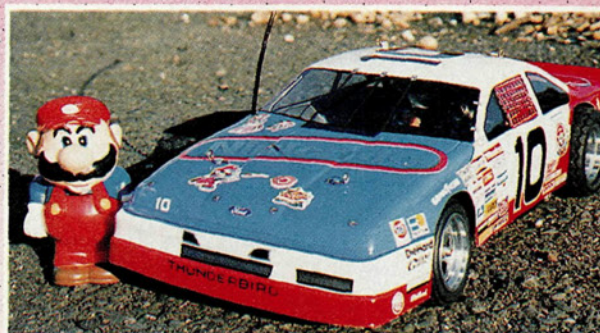


## ROBOTRUCK

David Semanik of Parma, OH, beamed us this photo of the future of law enforcement! A Traxxas Sledgehammer serves as the rolling chassis, and the top from a Robo Cop van serves as the body. The truck—Urban Assault—has been souped-up with a modified motor and ESC. It looks as if Dave and his vehicle are ready to stage their own war on anyone who defies the law!

## MARIO'S T-BIRD!

Paul Zack, of Haledon, NJ, wanted a car that was different from the rest, and he sure has one now! This TRC Pro-10 has a Futaba radio system, a 10L front suspension and Sees aluminum wheels, and the 1989 Ford Thunderbird body is decorated with hand-cut decals and other scale touches. Mario and his



brother Luigi act as drivers and pit crew. Do you think Paul fried his brain playing too much Nintendo?

## SWEDISH SCREAMER

Anders Grip of Pettersbergsvagen, Sweden, sent in this picture of his Schumacher Cat. To control this fast feline, an Alpina PCM radio works in conjunction with a KO Propo servo and a Navak T1X ESC. Anders has a choice of a Revolution or Parma stock motor—a tough decision, because he says both really scream!





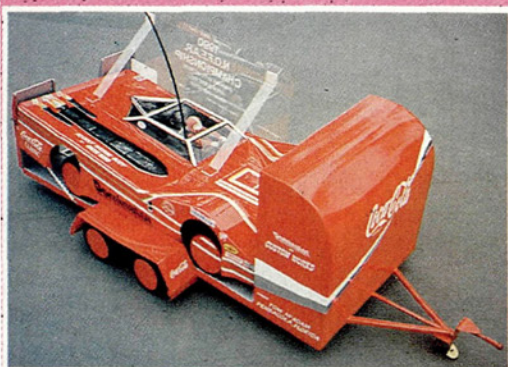
## INFECTED!

"Kyosho Kraziness" has struck Joel Ambrozi of Carbon Cliff, IL! The tow vehicle is a Hi-Rider Vette that has a Twister Ultrastock motor and a Futaba radio system. On top of the custom trailer is a maxxed-out Turbo Ultima with a Trinity graphite chassis, a Kyosho Super Stock 34-degree motor and a Novak ESC. With this kind of workmanship, let's hope the disease spreads!



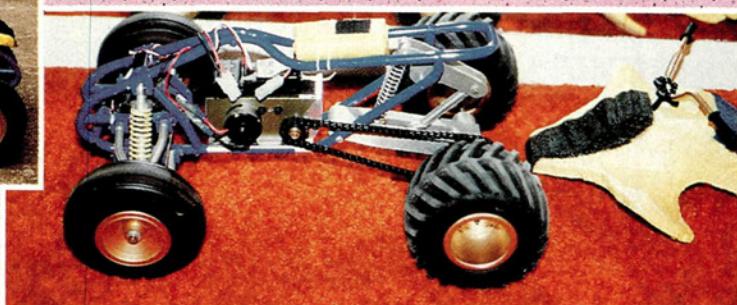
## CUSTOM WORKS TRAILER

This concurs contender comes to us from Tom McAdam of Pensacola, FL. The Custom Works Dominator is armed with a new Rocket Wedge body and a Phoenix 314 motor. A modified trailer, which is based on Jim Shepka's "Low-Dollar Custom Trailer" article, tows this slick car around, and a JR-X2 with an Andy's Jeep Comanche body is in the works to help pull this wild ride.



## QUARTER QUAD

This 90-percent scratch-built quad is the work of Kevin Holmlund of Manassas, VA. The chassis is hand-bent aluminum, and the body is plastic-coated foam. Kevin made the plans by blowing up photos of his full-scale quad. The workmanship is consistently good throughout, and everything is handmade—from the shocks to the gears! A subscription is headed Kevin's way for this incredible machine.



## FLYING FLATBED

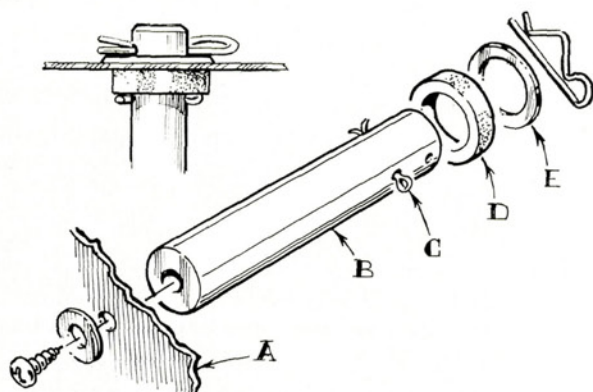
John Mayfield, who lives at the Yokota Airbase in Japan, scratch-built this flatbed pulling truck. The chassis was created using high-grade aluminum and Clod Buster gearboxes. With a 12V battery providing lots of power, two Dynatech motors drive the wheels. According to John, the truck's performance is outstanding. Maybe he uses the flatbed to haul away the crushed competition!





# PIT TIPS

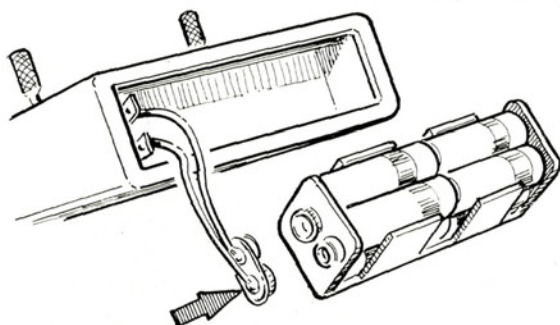
(Continued from page 12)



## DURABLE BODY MOUNTS

This economical custom body mount has been used successfully on several dirt-oval racers. Eight feet of 1/4-inch Delrin rod (B) cost Doug \$2.16; four rubber furniture bumpers (D) cost 69¢; and nylon washers (E) cost 10¢ each. C is a regular cotter pin. To mount, just drill holes in the chassis plate (A) and in the end of the rod, and use a sheet-metal screw and a washer. The Delrin is virtually unbreakable in this application (unlike some other body mounts).

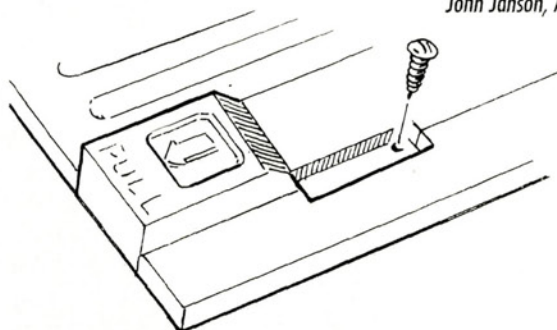
Doug Mertes, Burke, VA



## INTERMITTENT TRANSMITTER

John had trouble with intermittent battery contacts at the tabs inside his transmitter. As a solution, he bought a Radio Shack no. 270-325 9V battery snap and soldered its leads to the tabs; then he snapped the connector to his battery pack. He's had no further problems.

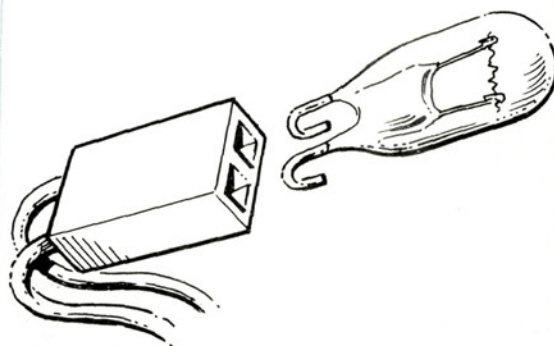
John Janson, Alsip, IL



## BATTERY COVER FIX

Here's that old Hornet/Grasshopper battery-cover problem again. (Heavy landings knock it off.) When the bottom of the chassis drags across the dirt, the cover slides off rearward. The simple solution? Drive a small, sheet-metal screw into the slot shown. The head of the screw prevents any further rearward movement.

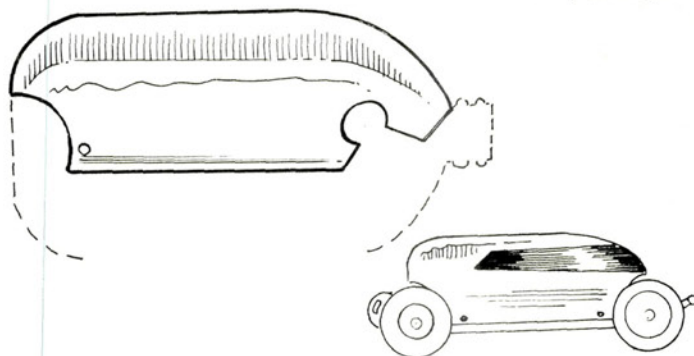
Chris Rowe, Overland Park, KS



## CONVENIENT DISCHARGER

Ever since he switched to Race Prep gold connectors, Mark has been able to use this very convenient discharger. He found that the curved wire contacts of a no. 194 automotive light bulb fit into the connector openings as though they were made for it! Just open the bends in the contacts slightly to ensure good contact, and discharge your battery packs until the light goes out.

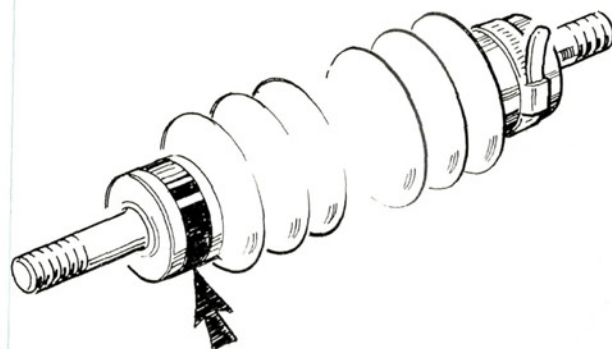
Mark Jobin, Absecon, NJ



## COKE-BOTTLE BODY

Now you can truthfully claim that your car is a 2-liter! This knock-around polycarbonate body is made by cutting a 2-liter soda bottle to the shape shown. To attach it to the chassis, use copper wire, plastic tube and body pins. This body lends itself to some wild paint and decal schemes!

James Glass, Bristolville, OH



## NEAT AXLE-JOINT BOOT

On the Tamiya Frog, the axle (or drive-shaft) boots are attached with unsightly nylon straps and bulky buckles. Roy removed the straps and cut 1/8-inch-wide bands of heat-shrink tubes, which he then shrank into the grooves formerly occupied by the straps. This looks much neater.

Roy Wendell, Jane Lew, WV



# ROCK BUSTER



## Original

Two wheel drive. Rear differential.  
Rear differential. RS-540 motor.  
RS-380 motor. Oil filled shocks.  
Spring shocks. 3 speeds.  
3 speeds. Front torsion bar.  
#21331 (kit) #21772 (kit)  
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Compact size.  
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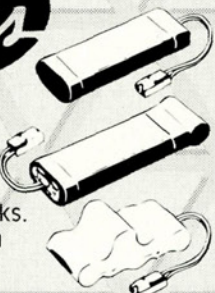
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Seven cell flat packs.  
Matched 1500mAh  
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# LETTERS

(Continued from page 9)

## OOPS!

I own an RC10 and think your hop-ups are topnotch; however, in "Build Your Own Pit Stop Radio" (March '90), the schematic in Figure 1 is incorrect. Pin 9, of the 556, is the output of the second timer, which should go to the servo or speed controller. Pin 8 is the trigger of the second timer, which should go to the output of the first timer (Pin 5). Otherwise, I found the article very useful.

CARL MIK  
St. Louis, MO

*Carl, we're sorry about the mistake in the schematic, but don't despair—"Scoping Out" author John Rist has sent us a new one. Check out his article this month; you'll see a corrected diagram and an explanation.*

WD

## SUPER-SLOW STOCK?

I recently bought a Kyosho 34-degree Super Stock. The instructions tell you not to break-in the motor because it would shorten its life. I just soldered the large capacitor and the motor wires onto the motor. I keep it clean and oil the bushings, but it won't go as fast as my old 360ST in the same car—my RC10. Is there something I've forgotten? Am I doing something wrong? By the way, you have a great mag!

RYAN KEITH  
Liberty, MO

*Ryan, there's a simple reason why your Kyosho 34-degree stock motor is slower than the 360ST: it's a 22-turn motor. ROAR-legal stock motors are 28 turn (plus or minus a turn), so the 360ST is a modified motor! Just keep the stock motor cleaned and oiled, and you'll get good performance.*

*By the way, you shouldn't be running the 360ST against cars equipped with stock motors! If you have been, don't tell anybody, and it will be our little secret. Just stick with the regular stock motors and you'll be fine.*

WD

## OP-ED RESPONSE

It was with some dismay that I read your April Editorial about classes for monster trucks.

First, Monster Beetles, Big Brutes and Blackfoots, etc., are inferior junk that's pawned off on the unknowing first-time buyer as "off-road racing trucks." This is a poor joke and a classic case of "let the consumer beware" (learn). These trucks are produced with relatively poor parts, are way out of date and use uncompetitive technology. Rather than take a giant step backward and create a special class for these dinosaurs, it would serve our interests to have the manufacturers of these products improve the quality and technology of their products to the level of the Losi JR-XT or Associated RC10.

The other issue is that Monster Beetles, Blackfoots, etc., really hurt a lot of kids. They buy them, play with them for a short while and then show up at the track. Their experience there is often traumatic and heartbreaking—their race trucks barely make it around the track. They either quit the sport because there are no available parts to make their trucks competitive (no support from manufacturers), or they spend another \$200 or \$300 to get a truck and radio that work.

All this could be resolved with a commitment to produce quality competitive trucks. This will improve the sport for all.

ROBERT G. O'MEA  
San Diego, CA

*Robert, I'm dismayed by your response to my Editorial. You state very clearly the exact reason why there should be a production class restricted to monster truck kits. They are the perfect entry vehicle with which many new racers get into the sport. The reason for their frustration and heartbreak at the track is that they're forced to race their kit monster trucks against the purists' conversion kits and full race trucks that cost much more. True, these kits may use some "out-of-date technology," but they're certainly competitive against one another. As for the breakdown problem, if more experienced racers were*



... willing to help these beginners get around the track without breaking down, they'd probably stick around much longer. And there are after-market parts available for many of these entry-level monster trucks.

Remember, Robert, not every R/C car or truck has to be a full-fledged, all-out racing machine. Many are used for running around back yards and school yards, but everyone driving one of these cars is a potential racer at any local club—if they're given the chance to run what they have, rather than being forced to spend big bucks before they can even find out if R/C racing is for them.

Let's all see what we can do in 1990 to make R/C car racing the sport that it can be. (For more on this controversy, check out "Truck Stop" in this issue.) RH

### BEARING BLOW-OUT

I just finished reading Wally David's article, "I Survived the Thunderdrome" (Jan. '90), and I think it's the best I've read since I started reading your magazine! It's nice to see how the pros help amateurs or anyone else who needs help.

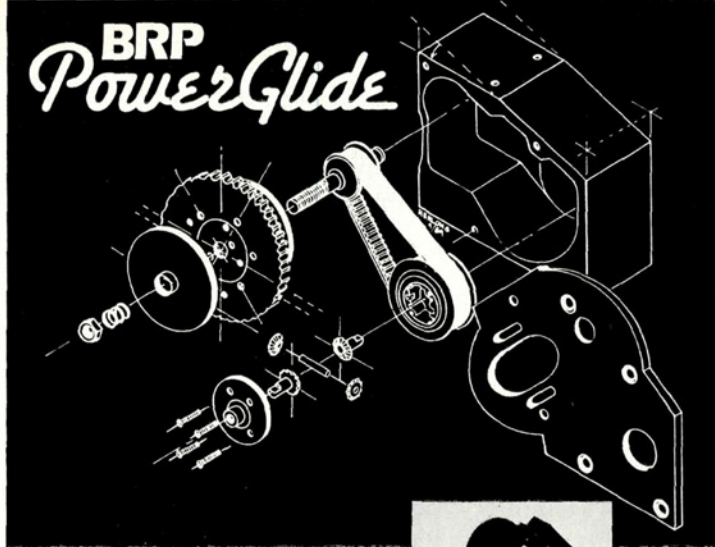
I have a complete set of after-market bearings for my RC10, and I'm a little upset about their quality. I was practicing before a race and making final adjustments to the track when the bearing in the rear hub casing blew apart. I wouldn't usually complain about this because things like this do happen, but when I read an article in *Car Action* that said that bearings aren't as good as they used to be, I was mad! I'd rather pay \$10 for a bearing that would last, instead of \$2 for one I have to replace every time I turn around.

Keep up the great work, and keep the manufacturers on their toes so that they'll continue to provide us avid race fans with some great products.

MIKE SWANSON  
Omaha, NE

Mike, thanks for the nice words about "I Survived..." On the bearing topic, you're right; it's very frustrating when bearings fail at crucial moments.

(Continued on page 22)



5000 RC-10 Trans  
5001 Ultima Trans  
**\$129.95**

#### Ball Slipper Clutches



#### Fits:

- MIP Trans
- Optima Mid
- JRX2
- Top Cat

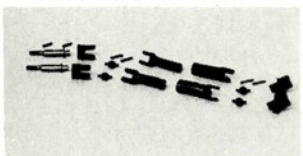
**\$34.95**

#### Features:

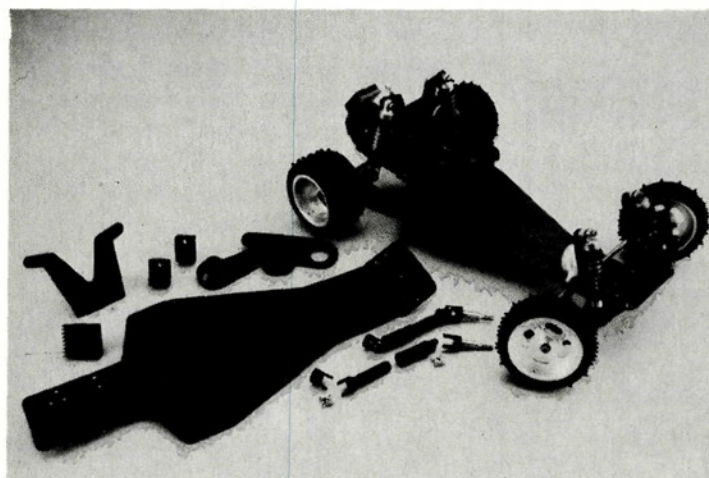
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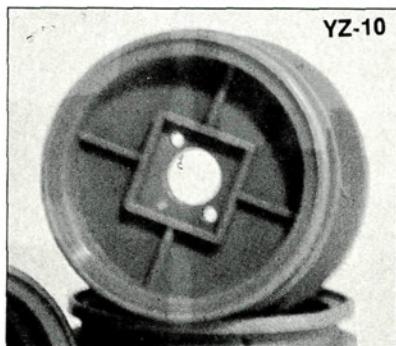
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YZ-10

## DIRECT BOLT-ON MONSTER TRUCK RIMS

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- 1454 RC-10 Rear Nylon Direct Bolt on Rims.
- 1455 Kyosho Front Nylon Direct Bolt on Rims.
- 1456 Kyosho Rear Nylon Direct Bolt on Rims.
- 1457 YZ-10 Front Nylon Direct Bolt on Rims.
- 1458 JRX2 Front Nylon Direct Bolt on Rims.
- 1459 JRX2 Rear Nylon Direct Bolt on Rims.

Set of Two: \$6.95

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# LETTERS

(Continued from page 21)

It's true that bearings are more expensive than ever, so in an effort to keep down prices for consumers, lower-grade bearings are used. With frequent cleaning and a light oiling, you'll still get good service out of them. Used with motor or bearing spray, the Cheetah Blaster Plus does a terrific job of getting the dirt out. A drop or two of light oil is all that's needed.

If you want high-grade bearings, they're still available, but you'll have to pay more. WD

## 1700 BLUES

Great magazine! Keep it comin'! I recently entered an on-road race that was strictly stock. The 1700s were allowed, but other than that, ROAR rules applied. During the practice session, I noticed a car that was going much faster than mine and those of my friends. I usually run with the best, and this time was no exception, but this car blew our hoods off! Its owner and his two friends were from an out-of-town club, and they were all running "pushed" cells. These cells looked like SCE 1700s and were labelled as such (no tampering was evident), so I chalked it up to experience and decided I'd just have to out-drive them. They took 1st, 2nd and 3rd places in the A-Main. Their cars checked out fine, and I didn't protest, as rules are rules and they hadn't broken them.

What's the story? Has ROAR addressed this issue, and if so, what's the final word? I'll abide by whatever is decided. I think that these are just fantastic for modified, but what about limited-budget stock racers who want to win races with skill and not with money?

CURTIS HARTING  
Wethersfield, CT

Curtis, you've brought up some interesting points. First, it's sometimes easy for local racers to assume that killer batteries are the reason "out-of-towners" come along and win races. In fact, they may have come from a track or club where the racers have more experience and a higher level of competition. Naturally, the as-

sumption is that the new guys are cheating or using trick batteries.

You say that other than the use of 1700 cells, ROAR rules applied. Well, ROAR rules do allow 1700s in stock and modified racing, so the rules were followed.

I checked with ROAR Administrator John Thawley, and he explained that battery suppliers "push" the cells—their own process for handling and matching them, and it isn't illegal. Thawley thinks it would be almost impossible to tell a 1700 from a 1200 if the shrink-wrap were removed. He said that until there's a way to tell them apart (e.g., if Sanyo would stamp a code on the cells to identify them—he has been talking to Sanyo about this for a while), he wouldn't mind seeing 1700s done away with completely. WD

## HAVE CAR, WILL TRAVEL

This summer, I'll be taking a long-awaited trip to visit my brother in Minneapolis and to race at his local tracks. He has many more tracks in his area than I do, and I'm looking forward to some real off-road race excitement. What's the best way to take my cars (RC10 and YZ10) with me on the plane? Is it better to pack them in a suitcase and check it, or should I carry them on in a car bag? If I do carry them on, will the X-ray machine have any effect on my electrical equipment and batteries? Will the airline people tear apart my carry-on bags when my equipment looks suspicious on the X-ray machine? As you know, the equipment is very expensive, so I'd appreciate any advice to help me get everything there safely.

ROBERT J. RENDOS  
Pittsburgh, PA

Robert, traveling with your R/C equipment can be a little tricky. Consult my January '90 article "I Survived the Thunderdrome." Carry as much as you can on the plane, but make sure it will fit under your seat, because it won't fit overhead. X-rays won't have any effect on your equipment, so you can pack your batter-



ies, chargers and radios in your suitcase. I once had to demonstrate my car at the Philadelphia airport security office because they didn't like the look of the batteries and all the wire. You could also pack everything into a well-padded cardboard box, secure the sides with packing tape, then check the box through to your destination. Have a great trip!

WD

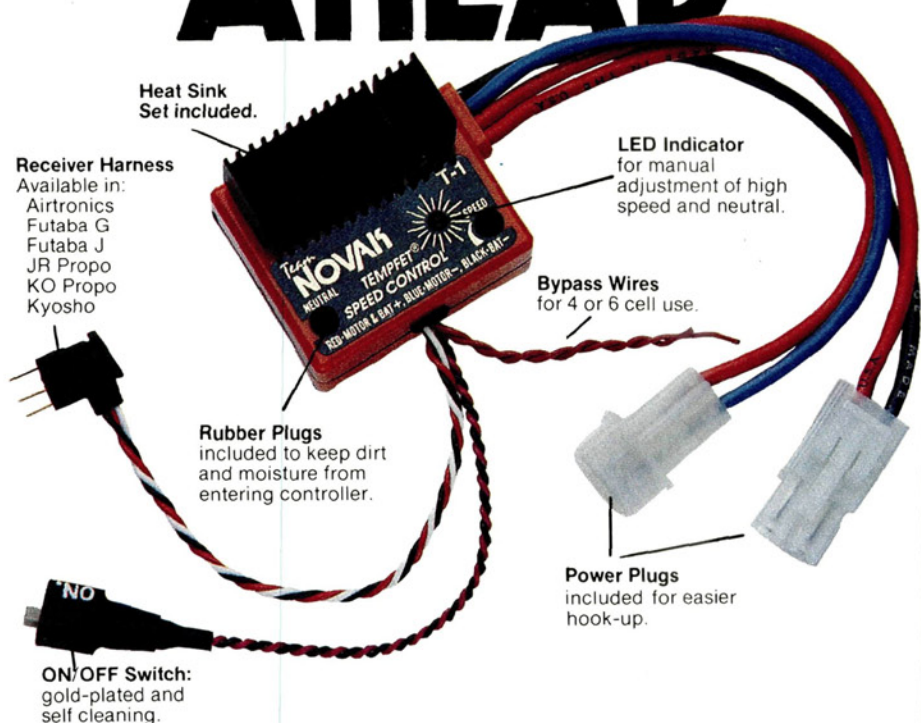
## CLARIFICATION

In my coverage of the East-West Oval Shootout in the March '90 issue, I referred to the Qualifier Controversy. Cars were limited to three 6-cell battery packs, whereas racers had been permitted to run an unlimited number of 7-cell packs at the western half of the Shootout. Bob Hosch, owner of Lake Whip-poorwill, was concerned that my article might lead readers to think that racers didn't find out about the change in the rules until they showed up at the track. This wasn't the case; all teams were sent a copy of the rules four or five weeks before the event. That's when the tempers and phone bills began to rise! Bob Hosch has built his reputation on his practice of never changing the printed rules at track-side, and if you ever have a chance to race at the famous Lake Whip-poorwill Speedway you can count on the rules being as printed. RH

## WHERE TO WRITE TO US

If you're writing to us (and we'd love to hear from you), please be sure to address your letters to "Letters," Radio Control Car Action, 251 Danbury Road, Wilton, CT 06897. Only subscription orders and inquiries are handled by our Customer Service Department in Mount Morris, IL; other mail addressed there must be forwarded to us in Connecticut, and this leads to long delays.

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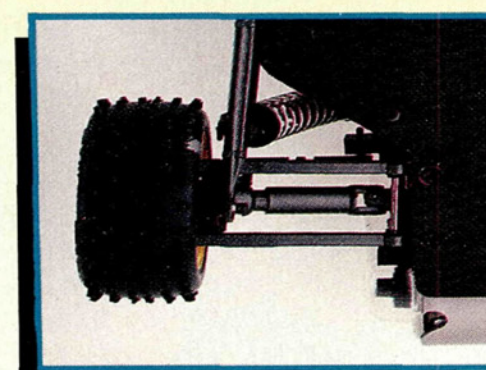
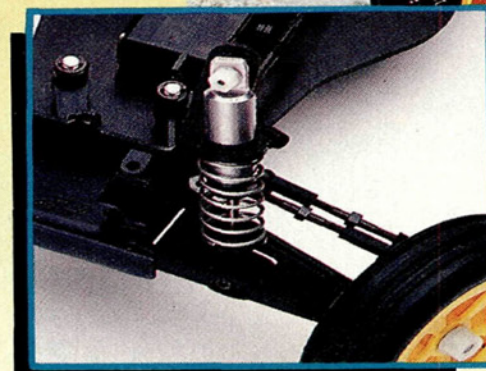
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# Car of the Year

**Top Banana, Courtesy Team Losi.**



by  
STEVE POND

**T**HIS IS THE THIRD time we've chosen a Car Action Car of the Year. In the past, picking the best all-around R/C vehicle caused great debate and even some physical "voicing of opinions"! As we approached this year's vote, each editor prepared for a toe-to-toe, knock-down, drag-out battle. We exhaustively rehearsed the reasons why our choice should be the winner. We rolled up our sleeves and put up our dukes, but when the ballots hit the table, they all had the same name on them!







# JR-X2



*If you haven't already guessed, we voted unanimously for Team Losi's JR-X2. Picking the "best" is partly a matter of personal preference. We don't claim to know everything about this hobby, but the hands-on experience we've had with just about every car on the market does give us an edge over the average enthusiast.*

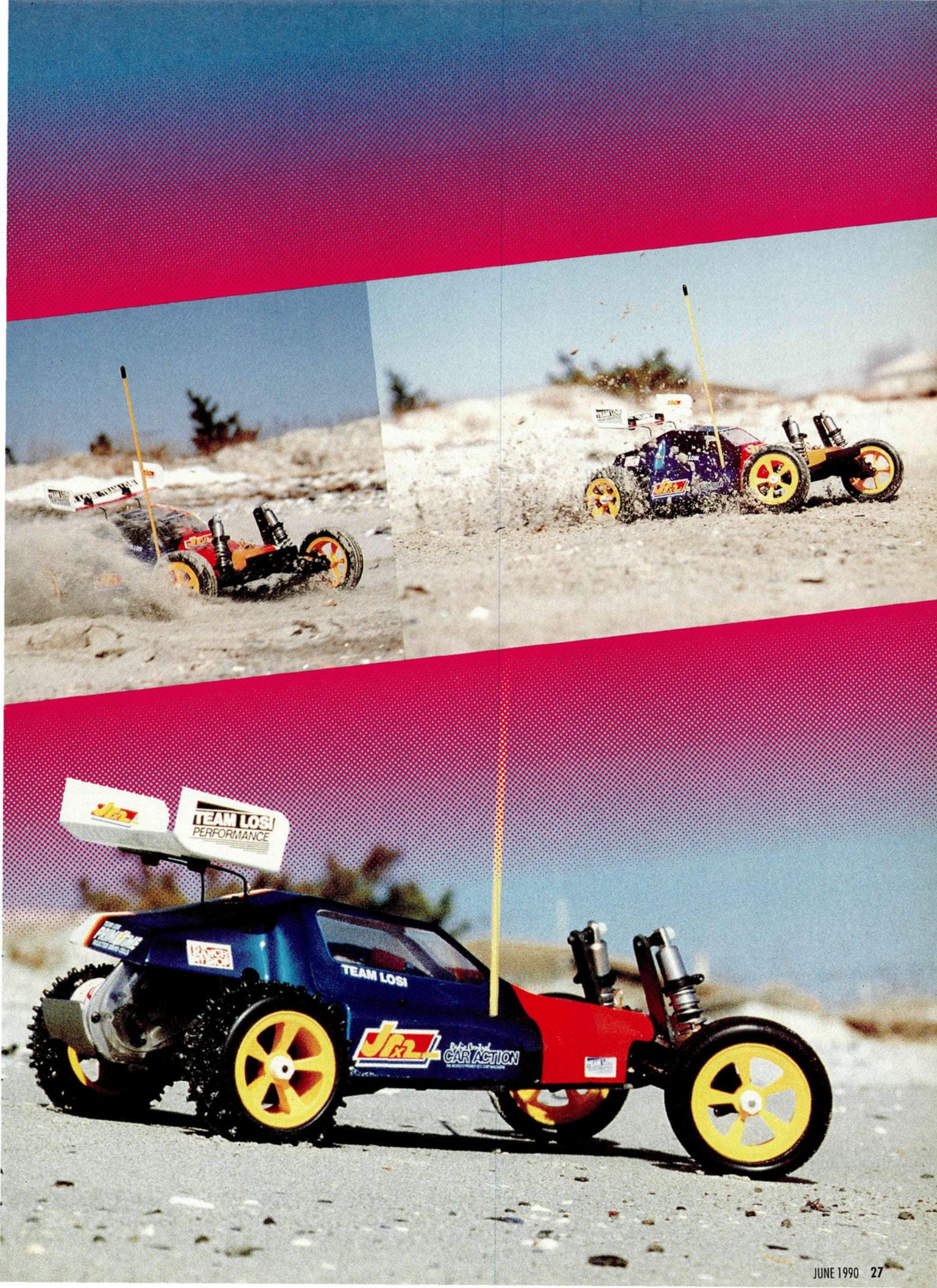
*Without a doubt, the JR-X2 is the most significant introduction to the R/C car world—and more specifically, the very popular off-road market.*

***The JR-X2's many race-bred features are unlike those of any other car. It isn't a clone or an updated version of an old design: it's a completely new-from-the-ground-up design...***

*The first JR-X2 hit the R/C scene in 1987—a time when being competitive in off-road racing meant spending twice the price of*

*a car kit on high-performance accessories. The JR-X2 kit included many of these go-fast goodies, while leaving out accessories that buyers usually "chucked" in favor of something more competition-oriented. The car was exactly what Team Losi claimed it would be—race-ready right out of the box.*







## TEAM LOSI JR-X2

Type ..... 2WD off-road  
 Scale ..... 1/10  
 Sug. Retail Price ..... \$299.95

### DIMENSIONS:

Overall Length ..... 14.75 inches  
 Width ..... 9.625 inches  
 Height ..... 6.375 inches  
 Wheelbase ..... 10.5 inches  
 Track (f/r) ..... 8.625 inches

### WEIGHT:

Gross (w/bat.) ..... 52 ounces

### BODY:

Type ..... Single-seater, off-road  
 Material ..... Polycarbonate

### CHASSIS:

Type ..... Single plane  
 Material ..... Graphite composite

### DRIVE TRAIN:

Primary ..... Pinion/spur  
 Transmission ..... 48-pitch gear drive  
 Differential ..... Ball  
 Bearings ..... Ball bearings

### SUSPENSION:

Front: Type ..... Lower A-arms/upper control links  
           Dampening ..... Oil-filled, coil-over shocks  
 Rear: Type ..... Five-link  
           Dampening ..... Oil-filled, coil-over shocks

### WHEELS:

Front: Type ..... Nylon, one-piece  
           Dimensions (DxW) ..... 2.375x.75 inches  
 Rear: Type ..... Nylon, one-piece  
           Dimensions (DxW) ..... 2.188x1.375 inches

### TIRES:

Front ..... Low-profile, grooved, natural rubber  
 Rear .. Low-profile, spiked, natural rubber

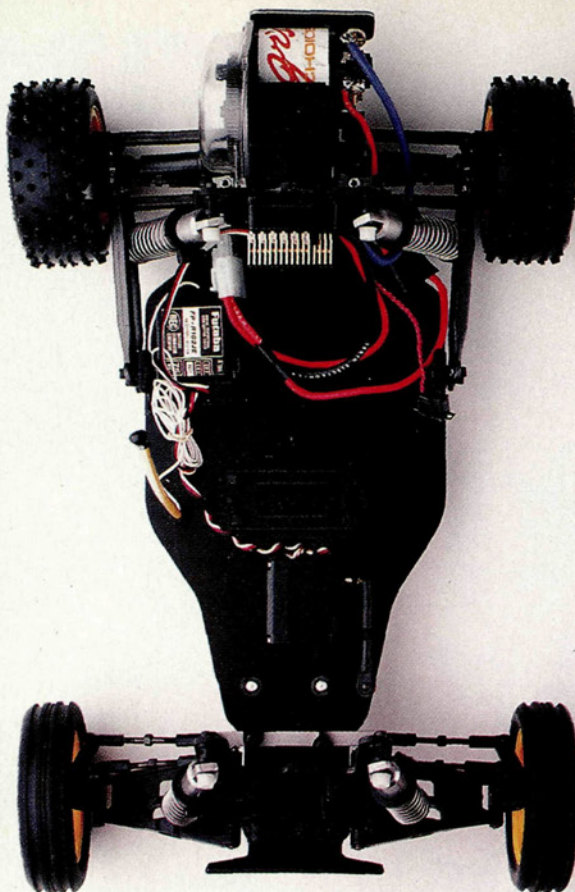
### ELECTRICS:

Motor ..... \*  
 Battery ..... \*  
 Speed Controller ..... \*

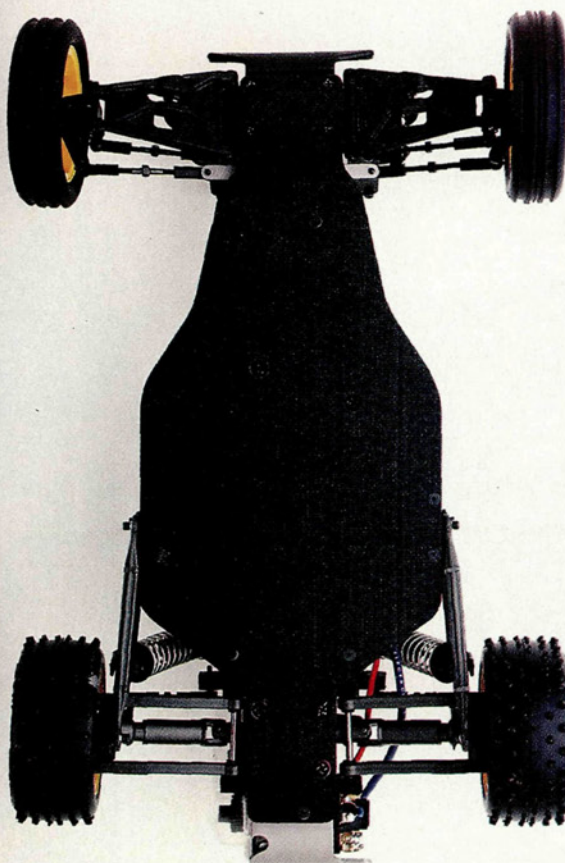
### COMMENTS:

Since its introduction, Team Losi's 2WD off-roader's performance and reliability has made it extremely popular. The JR-X2's unique five-link rear suspension has enough travel to work on the roughest of tracks. The low-rotating-mass (LRM) transmission is one of the most efficient designs on the market. With hop-up parts (e.g., rear H-arms) readily available from Team Losi, even team drivers use off-the-shelf parts to get dialed-in on any track. The record is clear: the JR-X2 is the 1990 Car of the Year.

\* not included

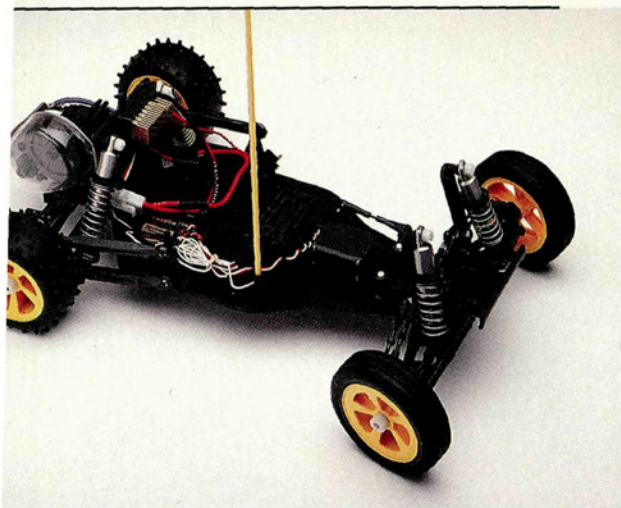


*The top view of the JR-X2 shows a clean design. Although it's a little cramped, racers have done a pretty good job finding places to mount their gear.*



*There's nothing on the bottom of the JR-X2 to snag on the ground and slow you down. Note slight rear toe-in for more stability.*





Early versions of the JR-X2 resembled today's car, but they had a few minor weaknesses. The front A-arms became somewhat brittle in cold weather so were fragile, and when improperly adjusted, the thrust bearing in the differential had a tendency to lock and damage the diff. In its relentless pursuit of perfection, however, Losi quickly designed new parts to keep the car on the track instead of the workbench!

The JR-X2's many race-bred features are unlike those of any other car. It isn't a clone or an updated version of an old design: it's a completely new-from-the-ground-up design that includes unique features for those all-important hot laps.

The JR-X2 is the first off-road car kit to include a rigid graphite chassis plate. The front suspension is also unique in that it uses extra-long A-arms to soak up bumps, and this helps to prevent bump-steer, etc. But the rear suspension is what really tipped the competition on its ear! The JR-X2 is the only car that uses a five-link rear suspension, which does wonders to improve its handling on rough tracks. Two of the links stretch forward from the axle blocks and are attached to pivot points about mid-chassis. Two



When it comes to handling the rough stuff, the JR-X2's front-end is one of the best in the business. The longer shock tower and long shocks on the front increase suspension travel.

## THE MAN BEHIND THE MACHINE

Late in the '70s, Gil Losi Sr.—“Pops”—bought his first R/C car at a local hobby shop. He had once raced a full-size car just like it, and he *had* to have it! The next Christmas, he picked up two cars for his sons, Allen and Gil Jr. Allen, who was very active with his dad's skate-board park, didn't show much interest, but Gil Jr. became obsessed with making his car run as fast and as smoothly as possible.



Gil Jr. set up a small track inside the skateboard park and held races, which quickly became so popular that he had to move the track, because the R/C activities interfered with the skateboarding. He also opened a little parts store nearby; if you needed a part during a race, you had to track him down to get him to open shop.

Gil Jr. soon had a reputation for being able to make almost any car go fast. He tinkered with a Cox Scorpion until he was winning every race! At about the same time, his father was working out a deal with Cox to buy the rest of its Scorpions, which had just been sitting on hobby shop shelves. Gil Jr. blazed a trail with it, and the Scorpion became one of the most popular cars on the market! The Scorpion's success helped the Losi family to start the Ranch Pit Shop in Pomona, CA, in the early '80s.

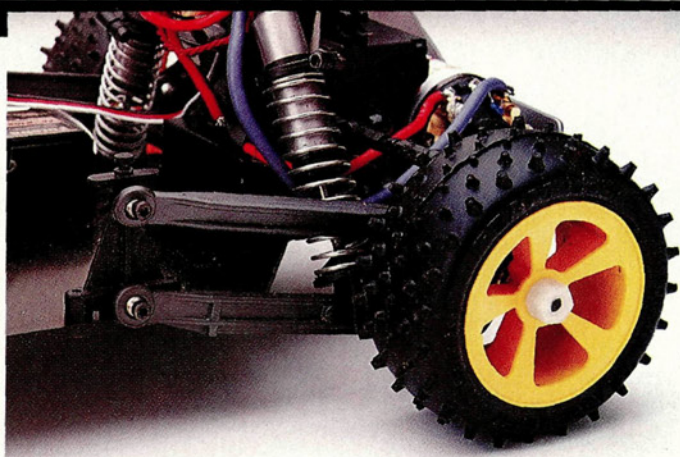
Recognizing Gil Jr.'s talent for making cars work, Associated Electric brought him in to work on the now-famous RC10, and later, he began to design his dream machine—the JR-X2. Although it's unusual to give credit for a car like the JR-X2 to only one man, Gil Losi Jr. deserves to take the big bow. The JR-X2 couldn't have been completed without the dedicated help of the Losi Team, but it's Gil Jr.'s baby. He's responsible for kickin' it into high gear!



# JR-X2

more come out from the transmission and are mounted to the axle blocks. The fifth is the upper turnbuckle link for caster adjustments. H-shaped rear arms were later added to the X2's arsenal of optional equipment, which enhanced its handling on well-groomed tracks.

The high-tech goodies don't stop there. The JR-X2's dampening is also new; it has an aluminum shock body with a hardened-steel shaft. You might think this sounds standard for a high-performance car, but the quick-change seal/compensating system is the grabber. The seal is inside an assembled cartridge, and this compensates for the increased volume in the chamber when the shock is compressed. Because the compensation takes place below the piston, oil con-



*The exclusive five-link rear suspension, standard on the JR-X2, is ideal for handling rough, ungroomed tracks.*

stantly flows past it to provide more consistent dampening. These fourth-generation cartridges are inexpensive and easy to replace when they become worn.

Springs for the shocks started out as standard, constant-rate coil-overs, but you can now buy progressive-rate springs that deliver more tension as the shock becomes compressed.

The LRM design is exclusive to the JR-X2 transmission (see sidebar). The JR-X2 doesn't have the previously popular dogbone drive, but uses splined drive shafts that are fixed to both the transmission and the axles. When the suspension is compressed, the slack is taken up by the drive shaft, which can compress and expand with little friction or loss of power.

The JR-X2 has other features that you'd expect to find on a car of this caliber. They include: a turnbuckle linkage for quick adjustment; bell-crank steering with a built-in servo saver and optional pieces that accept ball bearings; light one-piece wheels; tires for virtually any track; a complete set of precision ball bearings; and a vacu-formed Lexan body.

These features are enough to make a non-owner green with envy, but alone, they wouldn't be enough to collect Car of the Year honors. Other considerations must be taken into account:

- How difficult is the car to build?
- Is it durable? easy to repair? easy to adjust?
- Are replacement parts readily available?
- How much money will buying one set you back?

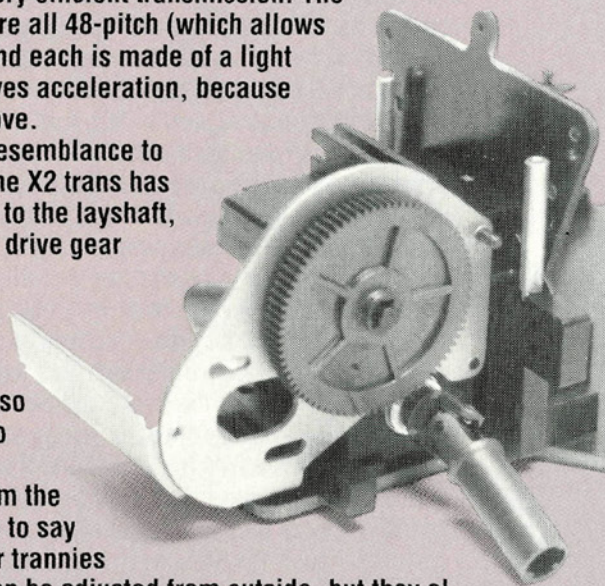
Enthusiasts often steer away from high-performance cars because of the

## THE TEAM'S...

### TRICK TRANNY

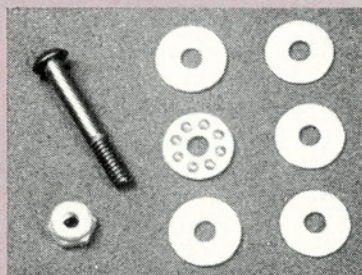
**L**RM. What the heck is LRM? It's an abbreviation for Low Rotating Mass, which is the basis of the design of the Team Losi JR-X2's very efficient transmission. The gears inside the tranny are all 48-pitch (which allows for smoother running), and each is made of a light composite, which improves acceleration, because there's less weight to move.

Bearing only a slight resemblance to other popular trannies, the X2 trans has an upper gear connected to the layshaft, an idler gear, and a final drive gear that's connected to the drive shafts. This tranny stands out from the crowd not only because of its LRM feature, but also because it was the first to have an internal ball diff that's easily adjusted from the outside. Before you write to say I'm wrong, read on: other trannies have internal diffs that can be adjusted from outside, but they al-



ways require the removal of a dogbone, an inspection plate, or any number of bolt-on accessories. In the unique X2 tranny, the diff is located in the center gear, and to adjust it, you just have to remove the dust cap.

This tranny is just one part of a superior design that's continually being improved. If it's any indication of Team Losi's potential, there are many good things to come, but for now, we'll be happy with the JR-X2!

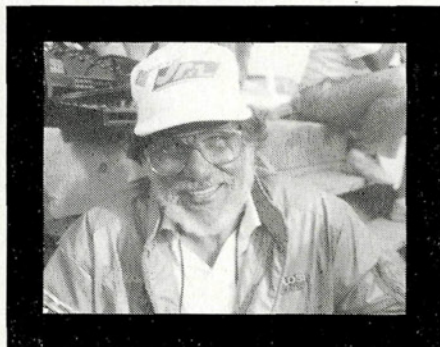


*This new thrust bearing is only one of many improvements that Team Losi has made to the JR-X2 since its introduction.*



level of skill required to make them work properly. The JR-X2 brings together high performance and entry-level ease of construction through its very explicit instruction manual! This isn't to say that if you've never seen an R/C car before you should run out and buy one, but as far as the fast ones go, this is one of the easiest to build.

Despite its race breeding, the JR-X2 can take its lumps with the best of them, and when you hit something hard enough to break it (which is inevitable), a tremendous supply of parts is available at most well-equipped R/C hobby shops. Repairs are fairly simple, and adjustments are easy to make at the starting line—with time to spare!



Gil "Pops" Losi Sr. is the guiding force behind Team Losi.

To the discriminating buyer, a car's most important feature is whether it's worth the price. The JR-X2 costs about \$20 less than its closest competitor!

You're probably saying, "This is all too good to be true. Where's the catch?" There isn't one! This car was designed and built by a company that's dedicated to providing a superior product at a fair price, and its "no compromises" approach has paid off. The JR-X2 is an excellent buy, and it will serve you well, whether you just want to bang around an empty lot or get in on some full-tilt racing.

Team Losi has assured us that, despite its car's success, development and updates will continue as they try to provide consumers with the best possible product. The JR-X2 should be a front-runner for a long time! We thank Gil Losi Jr. and the rest of the Team for creating this superior off-road machine, and we congratulate them on winning *R/C Car Action's* 1990 Car of the Year Award! ■

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# TRUCK STOP

by DAVE SPROUL



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## Racing or competition: which is which?

**M**ONSTER TRUCK COMPETITION—it's different from monster truck (MT) "racing." I'll explain: MT racing, as we know it in R/C, is actually the same as what's called "stadium racing" and "Baja racing" in full scale.

Full-scale MT *racing* involves car-crushing events, which usually take place in a stadium or an arena.

I'll go on. As defined by the National Radio Control Truck Pull Association (NR/CTPA), R/C MT *competition* is the

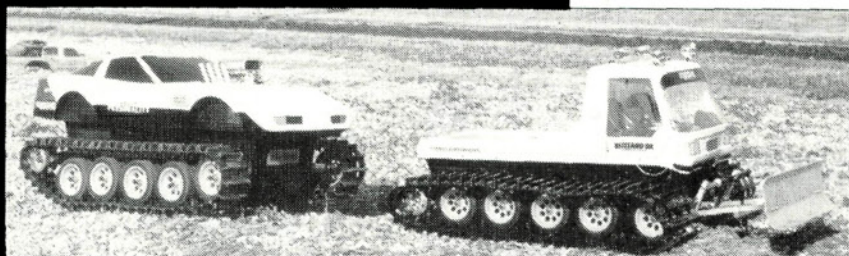
same as its full-scale MT counterpart: the heavy-metal class in off-road R/C racing is Mickey Thompson-style stadium racing over jumps, with a track full of trucks banging together, not true-to-scale MT racing.

## MAKING TRACKS WITH MONSTER TANKS

**O**WING to requests from monster tank fans, the NR/CTPA has added rules for a monster tank class in MT competition for 1990.

Basically, this class will include any production R/C tank or Snow Cat chassis that has been modified for racing and fitted with a car or truck body. Since no manufacturer makes a monster tank (yet), these will all fall into the same modified class. If you've seen how fast the full-size monster tanks can go, you can imagine what we can do in scale!

Looking for a tank chassis to convert? I still see Tamiya's Tiger and Leopard tanks advertised occasionally. (Your hobby shop might have one stashed away from days gone by.) Recently, Kyosho re-introduced its Blizzard Snow Cat. Since demand for these is high, it might be difficult to find one, but keep trying. Don't be afraid to ask! You might stumble onto a good deal.





Confused yet? It gets worse. I haven't even mentioned monster tanks yet! *Tanks?! What class is a tank?*—certainly not an oval racer, or an on-road vehicle. Maybe a stadium racer? I don't think so. I guess that leaves the MT racing category—or was that MT *competition*? Are you still with me?

As the R/C manufacturers bring improved trucks to the market, it's become increasingly difficult for the sanctioning bodies to decide which should run with which. If you've seen the new Tamiya Nissan King Cab run, you'll know that you certainly don't want to race against it with your stock Blackfoot or Big Brute! The same is true for the TRX-T and JR-XT.

I think Rich Hemstreet's proposal in his April '90 *Car Action* Editorial has merit. Rich proposed three truck racing classes; the first was the Production Monster Truck Class, which would include 6-cell monster truck kits with stock motors. The second class was the Stock Race Truck Class, also limited to 6 cells and stock motors, but including all conversion kits and the new breed of race trucks. The final division was for the Open Race Truck Class with 7 cells and modified motors. The only things Rich didn't address were

the twin-motor 4WD trucks, e.g., the Clod Buster, Double Dare and the new USA-1. Probably both stock and modified twin-motor MT classes should be developed. What do you think?

Maybe we should get into what is and what isn't a monster truck. Nah, that could take days! Well...maybe just for a minute. The new Kyosho Big Boss and USA-1? Definitely MTs. Tamiya Nissan King Cab? Race truck (stadium). Traxxas TRX-T? Ditto. Traxxas Sledgehammer? Good question; could almost be either. Losi JR-XT? Definitely a race truck. The Tamiya Blackfoot and Monster Beetle? MTs. Same goes for Kyosho's Big Brute and Hi-Rider Vette. Tamiya Clod Buster? Is there any question? OK, I think you've got the idea!

It all gets so confusing that at times I think I'll sell all my R/C stuff and buy a full-size monster truck. They only cost \$150,000 or so. If I sell all the R/C trucks I own, I could probably scrape together a few hundred for a down payment. Nah, it wouldn't fit into the garage, anyway!

Back to monster tanks for a minute: check out the pictures of "Split Personality." This is a sneak preview of my Kyosho Blizzard monster tank conversion. It has twin 05-size motors, modified tracks and suspension, and a Hi-Rider Vette body. Initial testing with LeMans 240S motors yielded a top speed that equals that of a stock Big Brute. We'll feature this conversion in a "how-to" article later this year. Stay tuned, tank fanatics!

I hope you enjoyed this lighthearted look at R/C MT competition (racing?) as much as I enjoyed writing it. My wife says I'm too serious most of the time! All joking aside; no matter what we call them or what we do with them, R/C trucks are just plain fun!

Well, it's been nice, but time is up. This departure from my usual style of writing has been fun. Anyway, may the bird of paradise—whoops, wrong line! May your truck stay shiny and win many trophies!!

See ya next time!



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# TROUBLESHOOTING

Welcome to "Troubleshooting"! If you're having a problem that your hobby shop or racing friends can't resolve, give us a shout at Car Action, and we'll see if we can chase down an answer for you. Questions should be of a technical nature and should be addressed to: Troubleshooting, c/o Radio Control Car Action, 251 Danbury Rd., Wilton, CT 06897.



ILLUSTRATIONS BY RICK HOWIE

**HANG A LEFT**

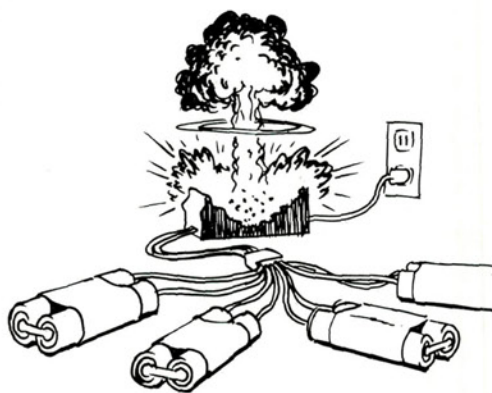
I own a fully modified Turbo Ultima; it has a graphite chassis, Hyperdrive belt system, Novak T-4 speed control, NER2-X 75mHz receiver and Sanyo 7-cell 1700mAh battery. When I gun the throttle, my motor goes, but my steering turns to the left! I know it's not my steering trim or low transmitter batteries, because when I let go of the throttle, the steering returns to its neutral position. I hope you can help.

**Frank Dziemalek,**  
North Branford, CT.

The problem you describe is common with the new, hotter-wind motors, especially with a 7-cell pack. When the car comes off the starting line or accelerates out of a tight turn, the amperage draw can be 100 amps or more! Under this load, the voltage of your 7-cell battery drops to approximately 3.5 (that's well below the 5V required to power the receiver), and this is what causes your momentary failure. When the car gets moving and the amperage draw from the battery tapers off, power to the receiver will be restored, and you'll regain control of the car.

Several simple, fairly inexpensive steps can be taken to prevent power loss to the receiver:

- Novak Electronics' Stutter Stopper can be plugged into the battery input on the receiver. When ample power is supplied, this capacitor takes on a small charge. When the power drops below that which the receiver requires, it discharges, supplying about 5 volts to the receiver for approximately 4 seconds.
- Alternatively, use a separate battery pack for your receiver. Assembled using very small Ni-Cd batteries, these packs can supply clean power for a day's racing. They're preferable to the Stutter Stopper, because the radio system is powered separately, and this prevents electrical noise from being passed to it through the speed controller. The result is an extended radio-system range and quicker, more precise control.

**AMPS IN YOUR PANTS**

We have two Protech chargers (models 706 and 707), and both are capable of trickling two batteries at once, or charging one while trickling the other. Can we install a Y-harness (split) for charging up to four batteries? Will the current stay the same? Will this technique harm or destroy either the batteries or the charger?

**Sean & Clyde,**  
Faribault, MN.

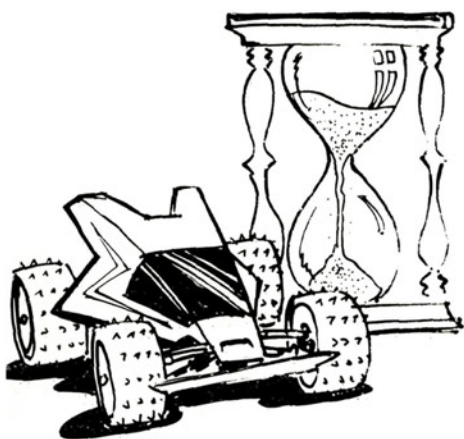
Provided the innards of your charger can handle four batteries, a Y-harness would



by STEVE POND

work, but the current being supplied to each battery would be halved. By adding another battery to each circuit, you essentially double the capacity of the battery being charged. If you connect two 1200mAh batteries in parallel (using a Y-harness), you're in effect charging a 2400mAh battery.

Whether trickle-charging or fast-charging, the charge time will be doubled, and if you're plugged into a 120V AC outlet, this could be very taxing and even harmful to the transformer inside the charger. Just charge one battery at a time, or, in your case, two. If you want to charge more batteries in less time, a second charger might be a good idea.



## RUNNIN' ON EMPTY

Have I got a problem for you! Last summer, I bought an MRC/Tamiya Thunder Dragon and was very pleased with its performance...until last month, when I replaced the stock motor with Yokomo's Esprit (the one with the pink label). I've had ridiculously short running times ever since.

At first, I blamed it on the old Radio Shack batteries I was using. I tried a couple of Sanyo Sport Packs, to which my dealer had added a seventh cell (to make them 8.4V battery packs), but the running time didn't improve. My dealer tested the packs to see if they had taken a full charge and they had, but my car still ran for only 2 1/2 minutes. When the car died, the batteries still had more than 8 volts left!

Up on blocks, the car ran perfectly, and the batteries kept it going for 15 minutes! I pulled out the motor and ran it without the car; with a freshly charged battery pack, it ran for more than 10 minutes. Back on the ground, however, the car refused to run more than 2 1/2 minutes!

The throttle seemed to be the only thing left that could cause this problem, so I tried my friend's (he has the same kind as I do), but my car ran for the same time. We tried putting in one of his Sears battery packs (which work well in his car), but my car only ran around 3 minutes with one and 2 1/2 minutes with the other.

We put my old motor back in, and using my friend's 7.2V battery packs (from Sears), the car ran for over 6 minutes! We then figured that the problem had to be with the motor I had bought, so we tried one of my Sanyo 8.4V battery packs with my old motor. Our best run with either was 3 1/2 minutes.

We're at a dead end. Could it be that my new motor and battery packs are screwed up, or our throttles are no good...or could it be that I'm completely crazy and should be assigned to a mental institution?! Help me!

Scott Wilson,  
Terrace, B.C., Canada.

You mention that you replaced the Thunder Dragon's standard motor (a Mabuchi 540) with a Reedy Esprit, which I assume is a modified motor. Because of the Esprit's substantially higher performance, you need a smaller pinion to get the run time you want. Because the batteries used in R/C racing are a limited power supply, there will always be a trade-off when you go to a high-performance motor. A battery has a limited life, and when you tip the balance toward higher performance, run time will be sacrificed. Think of the difference between jogging and sprinting: when jogging at a conservative pace, you can run for a long time; if you sprint, you'll go really fast, but you'll be exhausted in about 200 yards!

To worsen your problem, you added a  
(Continued on page 36)

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## TROUBLESHOOTING

seventh cell to the pack, and this increases voltage, not run time. The pack will still be 1200mAh regardless of the number of cells you add, but the motor will run faster, and this creates more amperage draw. Without a slight change in gearing, an extra cell will actually reduce run time!

Since your car ran for 15 minutes when you held it off the ground, there's obviously no problem with the car itself. (If the car only ran for 2 or 3 minutes this way, there's probably tremendous binding somewhere in the drive train.)

If you were to prop up the back wheel of a bicycle, as you did with your R/C car, you could ride almost as long as you wished. Now, take the bicycle off the stand, put on a heavy back pack and ride up a steep hill—not as easy, is it? The same principle applies to your R/C car. When the car is on the ground, the motor has to work harder to move it, and this uses more of the battery's limited charge.

If you want your car to run longer with the Esprit motor, use a smaller pinion gear (a 13-tooth pinion is the smallest available for the Thunder Dragon). It will make it easier for your motor to move the car, and this will conserve battery energy and extend run time.



### GRIND 'EM

I keep my RC10's motor going full speed when I hit the ground off a jump. My local hobby shop dealer says I'm wrecking, or "eating," my gears. (I still have my stock tranny.) Is that true?

**James Wegielewski,**  
Clifton Park, NY.

Ideally, your car's tire speed should be about the same as its ground speed when you land off a jump. Punching the throttle while the car's in the air puts tremendous stress on the gears when the tires grab solid ground. The transmissions in high-performance R/C cars are built to handle shocks like this pretty well, however. You might want to come off the throttle slightly when the car is in the air, and then get

back on it when it hits the ground. You won't lose any speed, and there'll be less wear and tear on the tranny.



### MOTOR MADNESS

I'm 11 years old. I got an RC10 last August, and I've set it up really nicely. I have TQ10 wheels and tires, bearings (which I haven't put in yet), a Futaba Magnum Sport and an electronic speed control.

I'm having trouble with my motor, though. It sometimes "glitches" and goes crazy! I took it to the hobby store where I bought it; they replaced it, and it worked fine. It happened again about a month later, so they replaced it again. It has worked until recently. Now I'm afraid to get another motor, because it might "burn out" again. I think the problem might be my speed control. I'm not sure what to do. Can you help? Thank you.

**Joshua Adams,**  
Sioux Falls, SD.

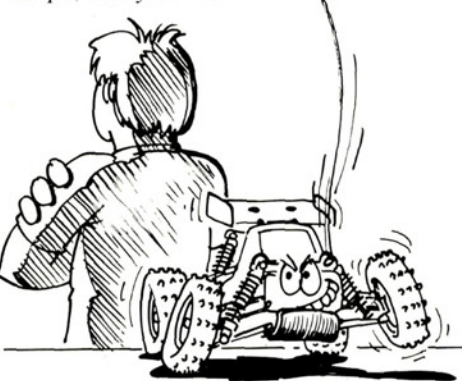
Many things can cause radio interference, but from what you've told me, it sounds as if you're not maintaining your motors. If a high-performance motor (stock or modified) is run for more than 5 or 6 races (or 5 or 6 battery packs' worth) without any kind of maintenance, the commutator will wear to a point at which the motor will generate electrical "noise," which could be the cause of your problems.

Without regular cleaning, lubrication and an occasional brush change, the commutator starts to wear out of round. This causes the brushes to bounce on the commutator. Without contact between the brush and the commutator, the current will arc across the gap and cause electrical noise, which causes pits and black burn marks in the commutator and accelerates motor wear.

To prevent this, clean your motor thoroughly with motor spray after at least every third run. Clean the commutator by



lightly pressing a soft commutator cleaning stick against it while spinning the motor with your fingers a few times. The round part on most cleaning sticks can be used to clean the face of the brush. After installing the brushes, put a small drop of bearing oil on each bearing, lubricate the commutator and brushes with some comm drops, and your motor should run well.



### OFF OR ON?

I recently raced my Yokomo YZ-10 (which has a B&R Dyno Stock motor and a Novak T-4) at my local track. When I took it to the pit to make a few adjustments and turned off the speed controller's switch, the motor started to run slowly. When I turned it back on, everything was normal. The speed controller works perfectly when turned on (in fact, I won the race that night), but when I turn it off, it keeps going. What do you think is the problem?

**Sammy Huen,**  
Alhambra, CA.

As long as your battery isn't dumped when you turn off the switch, you have a "leaky" Mosfet. The folks at Novak Electronics and Tekin say it's likely your brake Mosfet is damaged, and this is allowing a small amount of current to get through to the motor. Continued use of the speed control won't cause more damage, but the brake Mosfet will deteriorate. Send that speed controller in for repair!

### PUMP UP THE VOLUME

Lately, I haven't been getting much run time out of my JR-X2, Reedy Esprit motor and Pro Tech (adjustable-current) charger. I've used my friend's battery, but to no avail. Should I give my batteries more current while charging? Please help!

**Andrew Smith,**  
Topeka, KS.

(Continued on page 102)

# TURN UP THE BOOST!



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TEAM COMPETITION  
AT CLEVELAND  
INDOOR  
CHAMPIONSHIPS!

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ects." In each install-  
ment of this new series,  
we'll spotlight an excep-  
tional vehicle. Whether  
the car, truck—or what-

Jacqueline  
Thomas  
proudly  
holds her  
custom Clod  
Buster.



# H O M E - B U I L T P R O J E C T

## MARVELOUS MONSTER HYBRID

by WALLY DAVID

ever!— is an engineering  
marvel or just plain gor-  
geous, we'll have lots of  
detailed photos to let  
you see what's on it or  
in it.

These projects will be  
selected from "Readers'  
Rides" entries, so be sure  
to send clear photo-  
graphs showing the  
beauty or sheer awe-  
someness of your ve-  
hicle. If chosen, you'll be  
asked to send your ve-  
hicle to our office for a  
special photo session  
with our topnotch pho-  
tographers!







## PARTS LIST

**Kyosho:** Hi-Rider Vette engine and pipes; Big Brute fog lights and side-view mirrors

**APM:** hood-tilt kit, front bumper, side guard, upper and lower rear bumper

**Smokin' Hobbies:** bed cover

**Trinity:** Clod Buster modified motors and Clod Buster shocks

**Custom Chrome Parts:** suspension parts

**Futaba:** Magnum AM with 111B electronic speed controller and S131S heavy-duty steering servo

**IMEX:** chrome wheels

**Aristo-Craft:** monster truck tires  
Custom-made sun visor, bug screen

You first saw Jacquell Thomas's Clod Buster in the February 1990 issue of *R/C Car Action*. In my write-up, I said "his" Clod Buster had working headlights. Well, I was wrong! *He's a she*, and we have a picture to prove it!

Because they weren't too far away, Jacquell and her father, Tony Dye (of Passaic, NJ) accompanied me on a photo shoot one sunny afternoon, and we came up with some great results.

It's obvious that Tony and Jacquell spent a lot of time and made a great effort with their Tamiya Clod. This rig has many after-market parts as well as some parts made by Kyosho for the Big Brute and the High Rider Vette. Its front features many "trick" parts, the highlight being the APM Hood Tilt Kit. To achieve the tilting effect, the hood must be cut and a hinge used to attach it to the chassis; a servo then controls its movement. Tony uses a single Ni-Cd cell to power the servo, so creating incredibly scale-like, slow operation!

When the hood tilts, you'll see a good-looking engine that definitely isn't stock. The realistic engine and pipes come from a Kyosho High Rider Vette, and the fog lights mounted to the APM front bumper are actually from the roll bar of a Big Brute! If you try to find this Clod's bug screen or sun visor in your local hobby shop, you'll be out of luck, because Tony made them from scratch with clear polycarbonate and aluminum. Pretty sharp!

On the side of the Clod, Tony installed APM side guards and side-view mirrors from a Big Brute, and he used Autographics pinstriping to accent the beautiful aqua-and-white paint job. Another hot accent is the set of new fluorescent-pink *Radio Control Car Action* decals, which accentuate the other colors. At the rear of the Clod Buster, we find APM upper and lower round aluminum bumpers, and a brass ball hitch that's strictly for looks. A Smokin' Hobbies bed cover completes the package.

Having examined the exterior, it's time to look underneath, where Tony has made a major change to



A diamond-plate bed liner adds an extra touch of detail to the Clod.



APM Custom Hobby's polished aluminum bumper and skid bars are attached to the stock mounting locations for a sharp, chrome-plated look.



# HOME-BUILT PROJECT

***An ESP lift kit increases the Clod's height and makes it even more impressive than it usually is.***

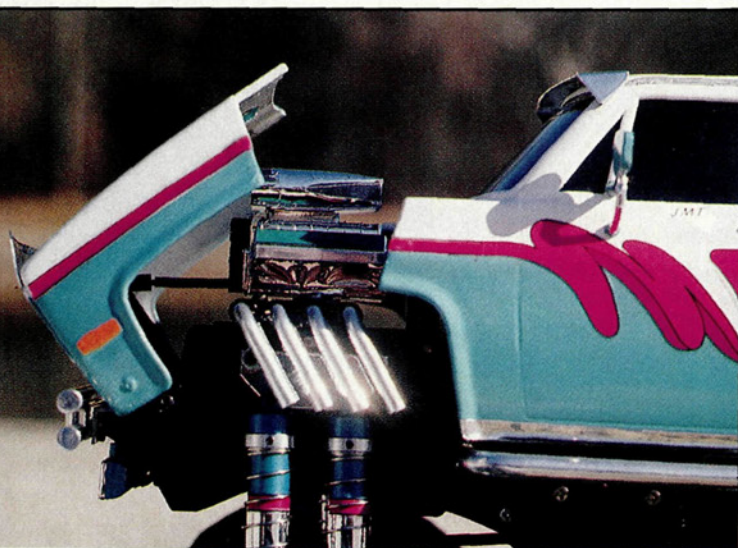
the shock department. He has replaced the stock friction shocks with a set of good-looking, blue, oil-filled, coil-over shocks from Trinity, and the two shocks on each corner really smooth out rough terrain. An ESP lift kit increases the Clod's height and makes it even more impressive than it usually is. Many of the stock suspension parts have been replaced with eye-catching chromed ones from Custom Chrome Parts.



To guide his daughter's precious truck, Tony chose a Futaba Magnum AM

radio, with a 111B electronic speed control and an S131S heavy-duty steering servo for efficient throttle and steering control. A pair of Trinity Clod Buster modified motors is used to propel the Clod and give it plenty of muscle! The finishing touch was achieved with a set of Aristo-Craft monster truck tires, which are mounted on Imex chrome wheels.

Tony admits that he and Jacquell don't really run the truck that much because they want to keep it looking sharp (and who can blame them?!). You have to admit, they do that extremely well! ■



With an APM hood-tilt kit, the bright chrome engine can be exposed for all to see. The headers are borrowed from a Kyosho Hi-Rider Corvette. Trinity Clod Buster shocks are mounted to the ESP lift kit.



# HOT TRACKS

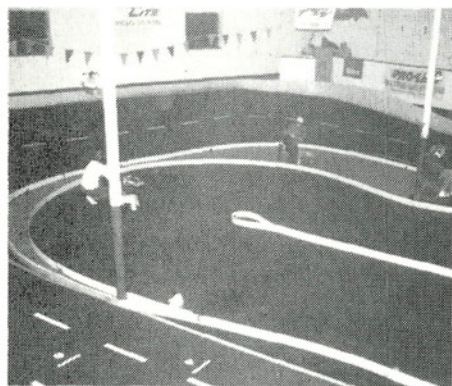
by WALLY DAVID

Welcome to "Hot Tracks." Each month, we'll choose an outstanding track to feature in this column. To qualify, send in some high-quality, black-and-white photos of your track, along with a description (approximately 500 words), and tell us why your track should be chosen. Send your entries to Hot Tracks, Radio Control Car Action, 251 Danbury Rd., Wilton, CT 06897.

## WILMINGTON R/C SPEEDWAY Wilmington, Massachusetts

**T**HE ENTRY FORM I received claimed that the 1990 Invitational Race of Champions was the closest thing to real racing, so I just had to check out the Wilmington R/C Speedway.

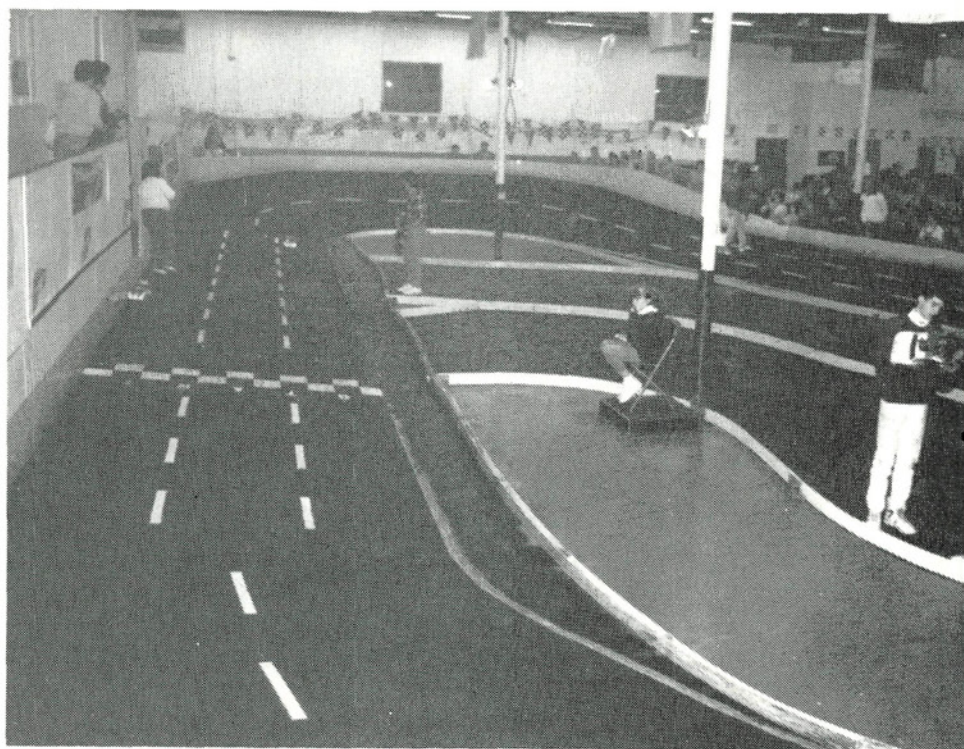
This 300-foot, high-banked, indoor, asphalt tri-oval in Wilmington, MA, really is like the real thing. Thirty-degree banking allows the cars to rip around the track at high speeds. At one end of the track, a sharp turn leads onto the front stretch, under the long, elevated drivers' stand. At the end of the long straight, two sweeping turns are connected by a short



straight, followed by the long back straight. With modified lap times in the 5-second range and average speeds around 40mph, there's plenty of excitement for racers and spectators alike.

The track's unique feature is the flexible, inner barriers that are made of double layers of thin wood. To minimize damage to the cars, the barriers are anchored to the floor in just a few spots, so they'll give on impact. There's plenty of pit space—enough to accommodate at least 150 racers.

If you need parts, you'll find a fully stocked hobby shop in the lobby area.



Also in the lobby is a complete concession stand with hot foods, sandwiches, snacks and beverages at very reasonable prices. When you want to take a break from racing, you can test your skill at a variety of video games.

Wilmington R/C Speedway offers classes for nearly every type of R/C vehicle. Wednesday is Stock Night: Stock Class uses 6-cell batteries and ROAR-legal stock motors, and Super Stock Class uses 7-cell batteries and any stock motor. Direct-drive and transmission cars compete separately. On Friday nights, there's racing for beginners and novices in all classes. Sunday's show isn't for the faint of heart: in the 3-minute races, anything goes and all-out speed is the goal!



From the high-banked racing excitement to the pleasant atmosphere, Wilmington R/C Speedway is worth checking out.

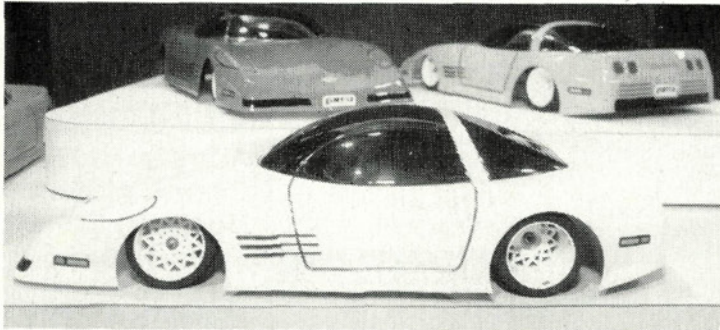
For further information, contact Wilmington R/C Speedway and Hobby Shop, 625 Main St., Wilmington, MA (508) 988-0770. ■



# INSIDE SCOOP

by RICH HEMSTREET

*The R/C car industry is rapidly advancing, with new products being offered at a head-spinning rate. So, I'll make manufacturers nervous, but feed you R/C squirrels who are hungry for info, by bringing you a special report on security leaks and "late-in" items. Here goes!*



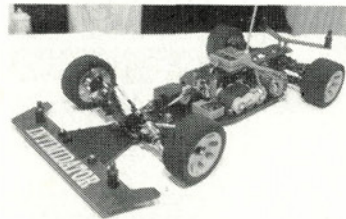
## A JUMP ON THE COMPETITION

**W**hen you first see a hot, new, full-scale car, it's usually a while before an R/C manufacturer makes the body and puts it onto hobby-shop shelves, but Parma has the

jump on everybody with its latest creation. Parma has introduced the 1995 Corvette body in 1/10 scale—five years before GM will introduce the full-scale '95 Vette.

## 2WD DOMINATOR?

**A**fter many attempts, the Custom Works crew has finally developed a 2WD dirt-oval racer with which they're satisfied. After the dominance of its 4WD big brother, the Dominator, the Intimidator certainly has a name to live up to. This new car has a super-



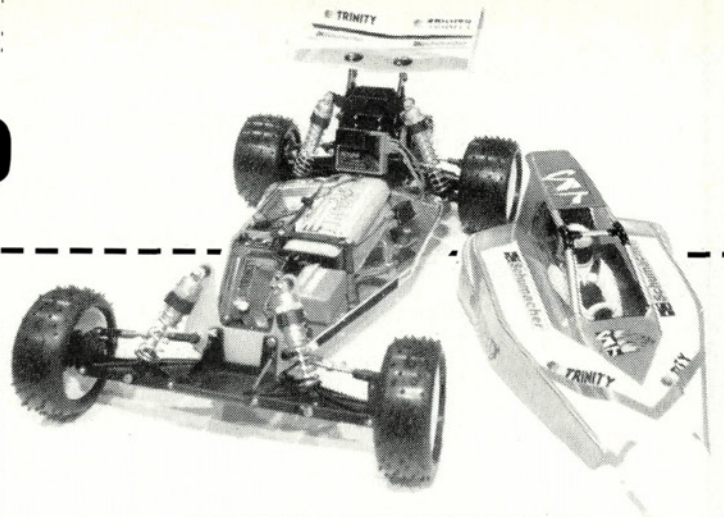
low profile that should fit under any of the wildest wedge bodies.

## AUTOGRAPH SERIES

**H**yperdrive Racing is coming out with a new Ralph Burch Special Autograph Series Hyper 10. These cars will be hand-built and prepared by Ralph Burch—in person!—before they leave the factory. Each chassis in the series will carry a serial number and will be signed by Burch.

## RETURN OF THE THUNDERDROME

**G**ary McAllister and Dan Moynihan are back—with Thunderdrome Number Three. This year's event is scheduled for September 5 through 9, 1990. The race will again be held in Encino, CA, on the famous 960-foot Thunderdrome track. Last year's event featured Kent Clausen's 70mph Insane Speed Run. Watch *Car Action* for further details.



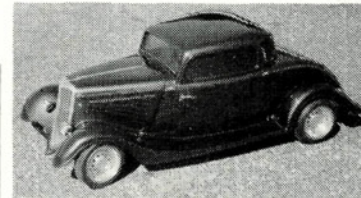
## COUGAR ON THE PROWL

**S**chumacher has come up with a new breed of cat for its 2WD lineup—the Cougar. This car features Schumacher's Kevlar belt-driven transmission and a 14-ball differential. The rear-mounted motor helps the Cougar's trac-

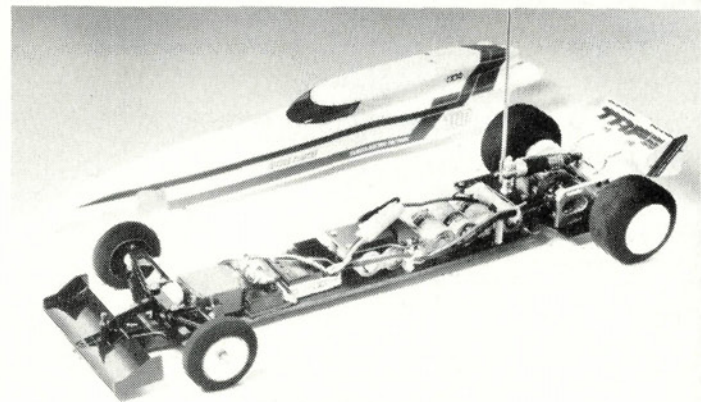
tion off the starting line. Up front, it has a new suspension geometry that has a unique, rake, angle-adjustment system and uses upright shocks. Watch for the Cougar; it should be hitting the tracks soon.

## FIRST-PLACE FULL-SCALE

**L**ast winter, at the Nassau Coliseum, GLD Racecars entered its 1/4-scale WCM 1934 Ford street-rod coupe in a full-scale Rod and Custom Car Show, and it was a hit! This beautiful little coupe took home a 1st-place trophy in the Special Interest Vehicles category. What a great way to in-



troduce R/C cars to a new audience, while bringing home a trophy at the same time. Way to go, GLD!



## SPEED RUNNER

**T**o see if it could break the 100kmh barrier using standard, off-the-shelf items, Tamiya built a one-off 1/10-scale dragster-style chassis. The speed run took place on a 90-meter track that has a 2-meter trap at the end of the course. Infrared sensors were

used to measure the top speed. At the controls, Mr. Taki, Tamiya's chief R/C designer, took the car through the speed traps at 103.43kmh—that's more than 64mph! The project was captured on film and was scheduled to be aired in Japan on national television in April.



# Kyosho Puts 1/8 Scale Gas on the Fast Track by Bill Jeric

Kyosho is launching a full scale campaign to bring 1/8 scale gas off-road racing to the attention and enjoyment of American R/C racers with a new series of sponsored races. The "Kyosho 1/8 Scale Off-Road Challenge" race series will work to bring you the best in experienced gas racers plus new entries from the ranks of electric racers.

## America Follows Trends in Europe and Asia

In Europe and Asia, 1/8 scale off-road gas racing is hot. The size of 1/8 scale both in terms of the machine and the track allows for greater realism and increased excitement. There is a heft to the machine that means serious business. Seven and one-half pounds of highly engineered components are propelled down the straights at speeds from 40 to 50 actual mph.

What R/C enthusiasts in Europe and Asia have found out is that driving 1/8 scale gas cars brings them closer to the real thing. The sound of the engines, the horsepower, the speed, the appearance and even the smell of nitro creates a rush of excitement that Americans can relate to and race to.

For drivers of 1/8 scale gas who come from the 1/10 scale electric ranks it's a chance to test their mechanical and driving skills with a machine that's faster, heavier and moves like a pit bull on a mission.

## New Event for Track Owners

The Kyosho 1/8 Scale Off-Road Challenge race series will be taking place all across the country. At chosen tracks, these sponsored race events will be given extensive publicity.

From these track locations, Kyosho expects the speed, the excitement, and the absolute fun of 1/8 scale gas to spread to selected R/C tracks all over America.

With 1/8 scale gas off-road a track owner is offered a new form of racing. One that turns up the volume and with speeds that can be best described as "ballistic." Spectators love the action and 1/8 scale runs a shiver up the back of R/C car hobbyists looking for a greater thrill.

Almost any good sized off-road track will accommodate 1/8 scale cars. Ideally, the

straights should be at least 100 ft. long and the lanes should be 6 to 8 ft. wide. Smaller tracks can simply run fewer cars per heat. An advantage of 1/8 off-road is that minimal track maintenance is necessary. These cars can tackle virtually any type of surface, no matter how rough.

Racers and spectators get more than just a few brief moments of action with 1/8 scale. In gas off-road, qualifiers are usually in the 5 to 10 minute range with mains lasting between 30 minutes and one hour. Pit stops for fuel are required during the main event.

## A Proven Track Record

Kyosho is ideally suited to champion the 1/8 scale gas movement in America. As a leading manufacturer of electric R/C race cars and monster trucks, Kyosho has developed the technology that recognizes the demands of racing at 40 to 50 mph speeds on terrain that can be smooth, rough or anywhere in between.

Kyosho's Burns DX and Turbo Burns 1/8 scale off-road cars are classic examples of designs that match the demands of the racing category. The result is a combination of years of experience with R/C cars and advanced engineering. Unique suspension systems, .21 buggy engines and chassis configurations work together to allow maximum speed with optimum control.

The Kyosho Burns series is an out front 1/8 scale competitive choice and was raced to 2nd Place in the 1988 IFMAR World Championships.

## Three Cars in One

All types of people are drawn to 1/8 scale gas cars. While 1/8 scale gas is ideal for dirt off-road racing, the opportunity for other forms of racing is clearly there. Some prefer dirt off-road courses while others lower the suspension, add an 1/8 scale ASA body and tear into some exciting dirt oval action. The addition of a set of slicks puts a 1/8 scale gas car on the asphalt for oval racing.

The versatility of 1/8 scale gives the owner an investment of three cars in one.

## 1/8 Scale Started It All

1/8 scale gas on-road racing is really the roots of R/C car racing as we know it today. In the 1970s, on-road gas was where it all began. Equipment was crude in those days and reliability was a major stumbling block to early 1/8 races. Electric racing came into being and is almost totally responsible for the explosion of interest in R/C cars of all scales, both gas and electric.

Today, with advances in technology of engines, radios and chassis, the 1/8 scale gas off-road category is a form of racing to be easily enjoyed by any R/C car enthusiast. Kyosho pledges to provide the push needed to raise the awareness of 1/8 scale racing and to rally the R/C racers who wish to share their interest in this high-speed racing class. The "Kyosho 1/8 Scale Off-Road Challenge" race series is only the beginning!

## You Can Become Involved

Kyosho is serious about getting 1/8 off-road up to speed in America. If you, your club or track are interested in a ground floor opportunity to get involved in helping to promote this new, exciting category, call Bill Jeric or Tom Grogg at Kyosho (217) 398-3630 or write c/o Kyosho, P.O. Box 543, Champaign, IL 61824-0543.



**Kyosho 1/8 Scale  
Off-Road Challenge  
Race Series**

**Watch next month for the  
latest information on  
race dates and locations.**





**I**F YOU HAVEN'T already heard, let me be the first to tell you: Tamiya's\* designers are waking up, and they're recreating their dreams in metal and plastic. Tamiya's latest dream-come-true is the Madcap—a 2WD, entry-level racer that might just change your ideas about what an entry-level R/C car should be.

As Hemstreet handed me a box with the word "Madcap" on the front, he said, "You can do this car, but you have to do it as a beginner's car." A beginner's car?

Aw, c'mon! I'm a veteran! I can turn any car currently made into a truck! I can build the most complex 4WD, multi-differential vehicle on the market! I can leap tall buildings in a...but rule number one of journalism prevailed: never turn down an assignment. "Yes, sir, Mr. Hemstreet, sir."

#### **THE KIT**

Tamiya must have forced its designers to watch continuous reruns of *Bladerunner*, *Star Wars* and *THX-1138*. For a wheeled vehicle, the

Madcap has a body that looks as though the power pods and canopy from an F-16 jet fighter were grafted onto a Terra Scorchers. It's perhaps the most striking Tamiya body I've ever seen.

I dug a little further into the box and what I found seemed impossible—a pan chassis. Yes, it was made of plastic, but it was, nonetheless, a pan chassis! This beginner's kit was beginning to interest me!

After a little more rummaging, I found a





# mad CAP

PHOTOS BY STEVE FORD

by BILL O'BRIEN

*bag filled with parts that looked as if they belonged to a ball differential. OK; wait a minute. I've owned my share of beginners' cars; we all have. (You remember; you bought that high-tech whizzer just to impress your friends.*



TAMIYA REDEFINES "ENTRY-LEVEL"



# MaD CAP

When you couldn't figure out how to put it together, you went out and bought the car you should have had in the first place, then told your friends that you were saving the techie car "for serious racing."). None of those cars had a ball diff—that was a \$40 extra—and you had to

disassemble the car to put it on!

Well, after years of resistance, Tamiya designers finally broke down and added a ball differential to their cars. The diff in the Madcap is the same one you'll find in the King Cab racing truck and in the Astute, the Madcap's

higher-tech sibling. The overall gear arrangement is still a planetary system, but gone (forever, I hope!) are the spider gears, which have been replaced by steel balls, conical washers, rings and all the other things that make a good ball diff. To help you in your trackside tuning, Tamiya has also included a choice of 70- or 77-tooth spur gears.

Aha!—here are the beginner parts: blue shocks! Well, actually, they're blue dampeners. Although these hollow tubes look like oil-filled shocks, they really hold nothing but the piston rod. The springs seem good, but I'll have to spend extra money on these later. There isn't a ball bearing or an Oilite bushing in sight (except for the two used on the differential output shafts). The Madcap uses nylon bushings, and when they wear out, they're gone.

Oh, look at the rest of the suspension! There's lower A-arms all around with fixed-length upper rods, just like Kyosho used on the stock version of the Ultima! With a system like this, you can't adjust the camber on these wheels. The tie rods are impossibly thin, and they aren't adjustable either. Great! I get to play with the car, then I get to play with the car...but I guess I should build it first!

## CONSTRUCTION

Three years ago, I made a bet that I could build a Kyosho

## ACOMS TECHNISPORT RADIO

**T**HE ACOMS NAME has been around for quite a while, even though it has been overshadowed in the last few years by the likes of Futaba, Airtronics, Aristo-Craft and practically every other radio manufacturer. Its latest offering—the Technisport—is a 2-channel pistol-grip radio that brings Acoms back into the 20th century.

You won't be startled by the Technisport's design; it's what you've probably come to expect of a pistol radio. Out of the box, the transmitter is set up for right-handed operators. Front panel controls include throttle dual-rate and trim knobs, both of which are full-size and knurled for easy use. A sliding panel at the left hides the servo-reversing switches for both throttle and steering.

Steering trim is handled by a rotary switch that's inset just above the steering wheel, and end rate is adjusted through a recessed thumb-wheel at the top of the pistol grip. A small power meter sits at the right of the control head, and the head itself is reversible for left-handed drivers. As I said, this is all pretty much the standard configuration.

There are, however, two points at which the Technisport deviates from tradition, the first of which is the antenna. Most radios force you to disconnect the antenna and slip it into a plastic clip, but on the Acoms unit, the antenna is permanently mounted to the radio on a hinged shaft

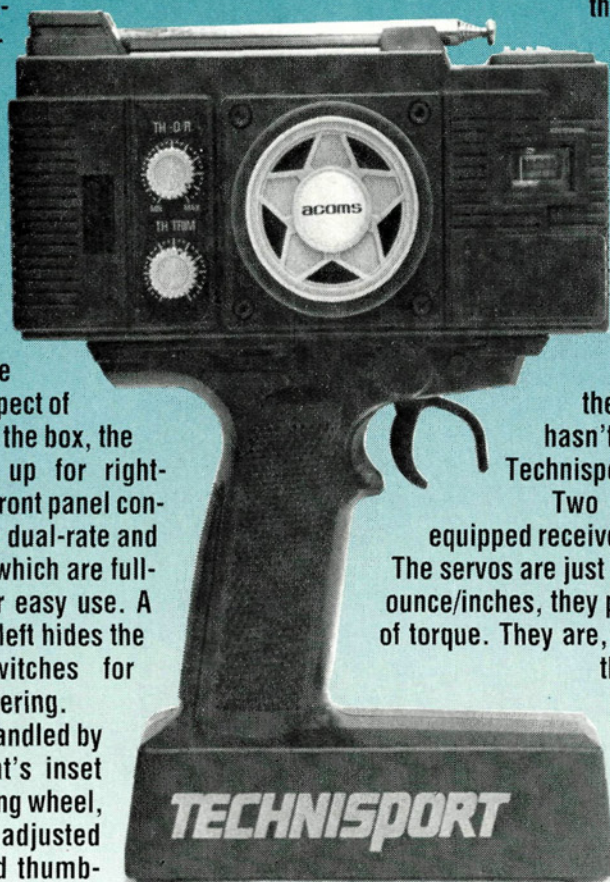
(similar to that of the old Futaba Magnum Senior). Simply collapse the antenna and fold it into place—no more broken clips and lost antennas!

The second deviation is in the placement of the on/off switch. Although there's a small panel on the front of the control head that could hold the power switch, Acoms has mounted it on the top, right side of the head. I've had several radios turn themselves on in transit because the power switch rubbed against the carrying case, but this hasn't happened with the Technisport.

Two servos and a BEC-equipped receiver round off the package. The servos are just the right size, and, at 42 ounce/inches, they provide the right amount of torque. They are, however, slightly faster than most servos: transit time is .28 second/60 degrees. The receiver is smaller than most; at 1<sup>15</sup>/<sub>16</sub> x 1<sup>1</sup>/<sub>2</sub> x 1<sup>13</sup>/<sub>16</sub> inches, it should give you a fighting chance against all but the

most compact installations.

Although there isn't anything new or exciting in the Technisport's engineering, there are two reasons to consider it: its one-year warranty (four times that of most 90-day wonders) and its price. Suggested retail pricing aside, the 75MHz version of the Technisport (there's also a 27MHz model) has appeared at around \$85. It's definitely not a bad deal!





## MADCAP

Type ..... 2WD off-road  
 Scale ..... 1/10  
 Price ..... \$175

**DIMENSIONS:**

Overall Length ..... 16 inches  
 Width ..... 9.5 inches  
 Height ..... 7 inches  
 Wheelbase ..... 10.75 inches  
 Front Track ..... 8 inches  
 Rear Track ..... 8.5 inches

**WEIGHT:**

Gross (w/bat.) ..... 52 ounces

**BODY:**

Type ..... Off-road buggy  
 Material ..... Polycarbonate

**CHASSIS:**

Type ..... Pan  
 Material ..... Plastic

**DRIVE TRAIN:**

Primary ..... Pinion/spur  
 Transmission ..... Gear drive  
 Differential ..... Ball  
 Bushings ..... Nylon bushings

**SUSPENSION:**

Type (f/r) ..... Lower A-arm/upper control rod  
 Dampening (f/r) ..... Friction shocks

**WHEELS:**

Front: Type ..... One-piece plastic disc  
 Dimensions (DxW) ..... 2x.75 inches  
 Rear: Type ..... One-piece plastic disc  
 Dimensions (DxW) ..... 2.2x1.2 inches

**TIRES:**

Front ..... Narrow mini spike  
 Rear ..... Wide mini spike

**ELECTRICS:**

Motor ..... 540  
 Battery ..... 6-cell stick\*  
 Speed Controller ..... 3-speed mechanical

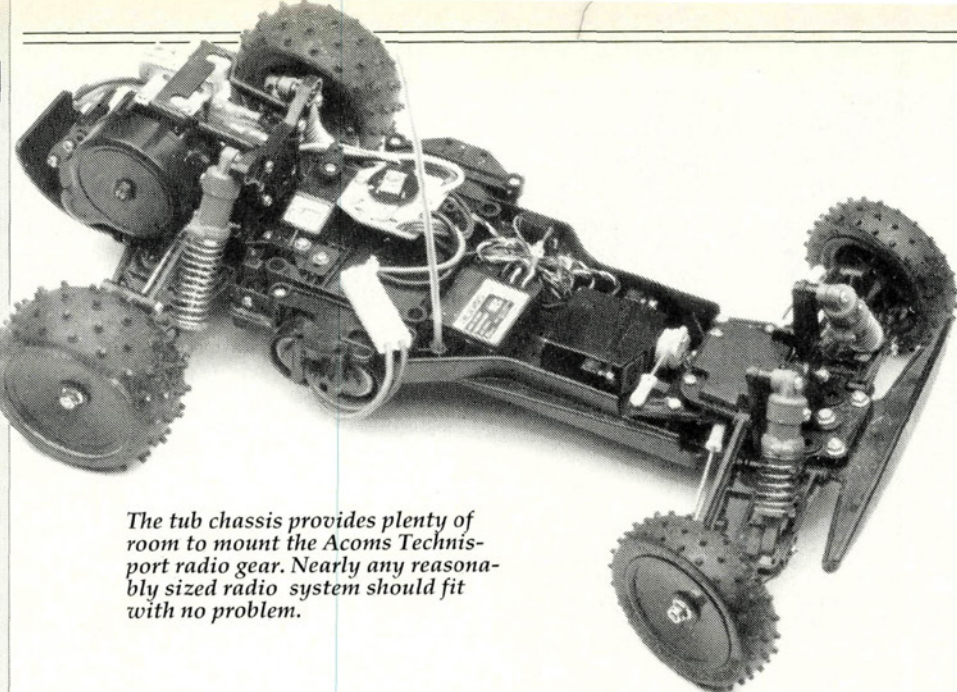
**OPTIONS AS TESTED:**

Acoms Technisport 2-channel radio;  
 Tamiya EX 1700mAh battery; Altech Blue motor.

**COMMENTS:**

Possibly the best entry-level car produced in the last year, the Madcap receives high marks for its price/performance ratio and "expandability." With the inclusion of a ball diff, Tamiya may have raised the caliber of entry-level cars. The Madcap should be competitive in the production class right out of the box. Ball bearings, different tires and new shocks will transform it into a real screamer.

\* not included



*The tub chassis provides plenty of room to mount the Acoms Technisport radio gear. Nearly any reasonably sized radio system should fit with no problem.*

Shadow 4WD buggy without an assembly manual; it took me 10 hours. I could make the same bet with the Madcap, tie my left hand to my right foot and still do it in less than eight hours. With the manual, it should take you about six.

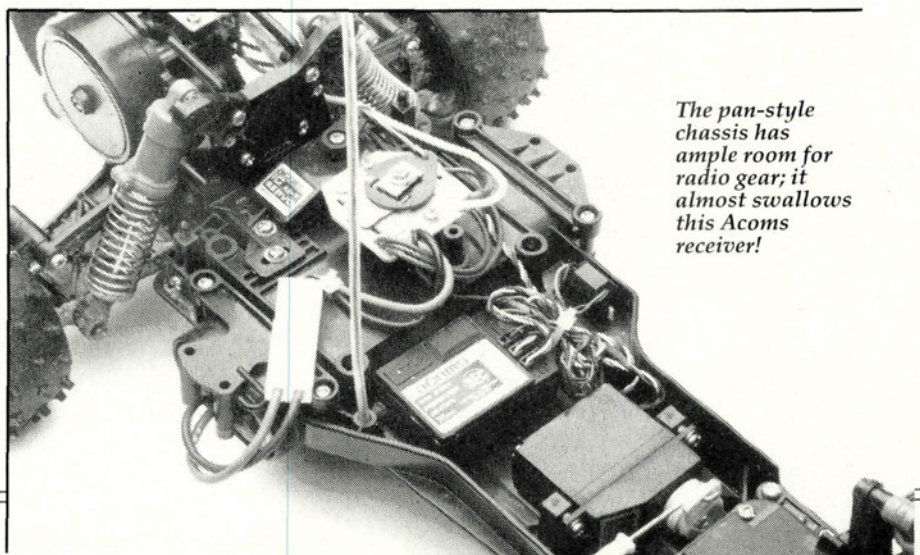
What's that you say? You can't tell the difference between a 3x10 and a 3x12 self-tapping screw through a cellophane bag? No need to worry: Tamiya assembly manuals set the standard for clean and simple construction. It isn't that you can't make a mistake, but you have to try so hard that it isn't worth the effort.

You'll only need a few construction tips, which are mostly common knowledge. First, make sure you remove all the flashing from the parts. The flashing is the excess material that's left on the part

because you bent and twisted it off the parts tree instead of cutting it off as you should have—it's that little piece that keeps sticking you in the finger when try to assemble the parts. Use an X-Acto knife or a pair of diagonal cutters (or even polycarbonate scissors) to trim the excess. If you want to do it right, use 120-grit sandpaper to sand everything flush with the contour of the part.

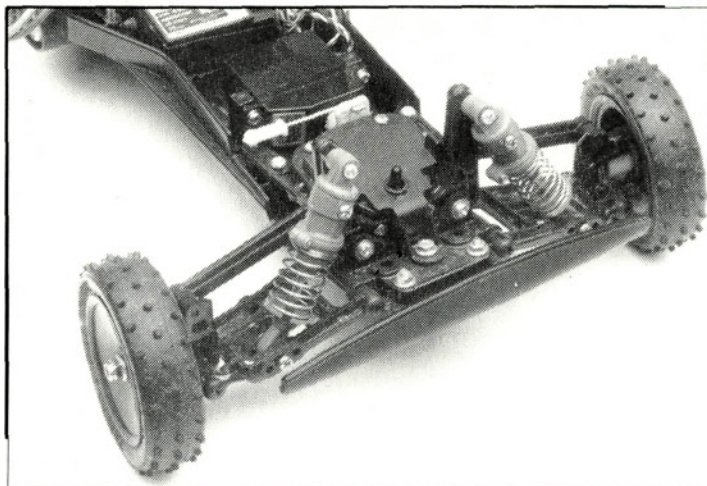
The only trouble spots are the front dampeners. Tamiya uses a 24mm rubber tube as a sleeve for each of the dampener rods. These tubes are too long for the short, front dampeners, so they actually interfere with assembly; a 20mm tube would be better.

Other than that, assembling the Madcap is a snap, almost literally! For added strength, many of the parts are inter-

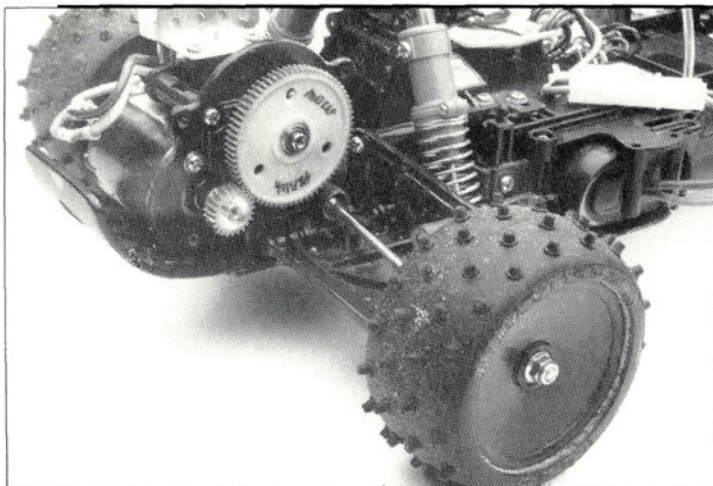


*The pan-style chassis has ample room for radio gear; it almost swallows this Acoms receiver!*





The suspension system on the Madcap is as elementary as the car itself. The setup works, but it's one of the areas on which you can improve as you gain experience.



This is the same differential you'll find in the higher-price cars like the King Cab and the Astute. The 70-tooth spur gear can be lifted out and exchanged for the 77-tooth gear that's also included in the kit.

**Right out of the box, the Madcap is probably the car you've been trying to find for your kids (or maybe yourself!)**

locking, and the three sub-assemblies (the front end, the rear end and the main chassis) are channeled and grooved for a perfect fit.

Keep in mind that the 23-tooth pinion gear is matched to the 70-tooth spur gear and to the stock 540 motor that's included in the kit to give you a 1:7.73 gear ratio. If you use a motor that has a little more pep, you'll need to modify the gear ratio (higher ratio, smaller pinion) to suit the track on which you're running.

I finished the construction in a decidedly uncharacteristic manner: I made it an MRC car through and through. Using the stock mechanical speed controller, I added an Acoms Technisport radio (sold through Altech Marketing\*) and one of Altech's new, blue motors with a modest wind. A Tamiya EX battery rated at 1700mAh supplied juice to the system. The battery-charging chores were handled by an MRC RB-497 AC/DC charger.

### OFF TO THE TRACK

I knew it was springtime: when I walked across a dirt track, my shoes made that sucking sound that make you wonder if they replaced the dirt with quicksand. Thankfully, the Madcap comes with

tires that have mini spikes that are widely spaced. There was little chance that mud would collect on them and kill the traction. (They're also good on hard dirt surfaces.)

The first pass around the track was devastating! The Madcap eats up jumps as if they were flat roadways, which surprised me because the car only has the spring dampeners. (It does tend to dip down slightly in front.) It had a tremendous amount of understeer, however, which forced it to go wide into every turn. I figured that was easy enough to correct, so I brought it in to adjust the suspension—only to rediscover that the solid suspension rods can't be adjusted. The only thing I could do was to change the spring tensions slightly (soften the front, tighten the back).

It's been a long time since a car has forced me to drive at less than 100 percent, so it was with great wonder and enjoyment that I relearned some basics. If the car understeers, back off the power going into the turn. Nine times out 10, the car will stay in line.

For the next 15 minutes and with the help of three extra battery packs, I used the Madcap to go back in time a few years. I remembered all

the questions I had about driving my first car; each question brought back the answer—and even the circumstances under which I learned the answer. When I had finished, I was smiling—something I didn't think I'd do with a "beginner's car."

### WHAT'S NEXT?

The Madcap is like the raw material from which real cars are made. In stock form, it can be competitive in production class. After you've learned how to drive, you should (at least) add ball bearings to the differential and the wheels. From there, the sky's the limit as far as suspension components, motors and batteries are concerned. The Madcap really is a blank slate.

Right out of the box, the Madcap is probably the car you've been trying to find for your kids (or maybe yourself!) so they'll learn how to drive an R/C car correctly. It can be upgraded as they learn, so the money spent on modifications is more like tuition than a subsidy. It's an interesting thought...but, then, it's an interesting car.

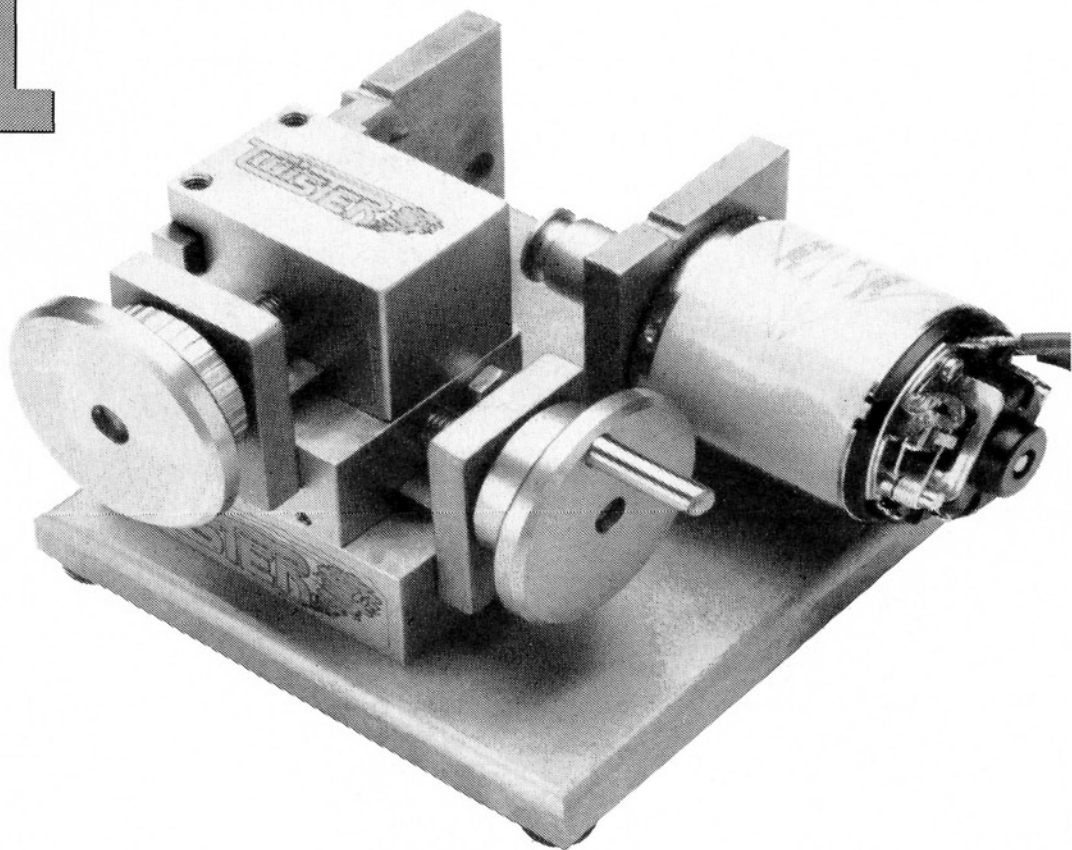
*\*Here are the names of the companies mentioned in this article: Tamiya/MRC, 200 Carter Dr., Edison, NJ 08817. Altech Marketing, P.O. Box 391, Edison, NJ 08818.*



# TWISTER mini LATHE

## The ultimate in motor maintenance

by STEVE POND



**T**IMES HAVE CHANGED since the days when we dipped our Mabuchi and Igarashi sealed-endbell motors in water to break them in. R/C racing has advanced so much that every little detail makes a difference, and the more details you pay attention to, the faster you go.

When it comes to dialing-in your car to your track, motors have always been of major importance. Whether it's choosing a particular wind, a certain brush compound, or the proper spring for the perfect tension that lets you go *reeeeaaally* fast, motors are vital. For optimum performance, you have to pay very close attention to the condition of your motor, or your competition will pass you

right by.

In the past, when a motor was so worn that it was losing performance, the only alternative was to send it back to the manufacturer (modifieds only), or to a rebuilding service to freshen it up.

Well, just as many other high-tech items have made it to the hobby-shop shelves and onto the workbenches of enthusiasts around the world, so has the precision equipment needed to bring your modified motors back to life.

### THE LATHE

Twister Motors\* has introduced the Mini Lathe, a machine specifically designed to cut the commutators on modified motors. Originally called the "Pocket Lathe," this unit is almost small

enough to fit inside a coat pocket, which makes it ideal for trackside motor rebuilding. Incredibly, there's no sacrifice when it comes to the finished product. The commutator will be just as true and smooth as when the motor came from the factory—or even more so!

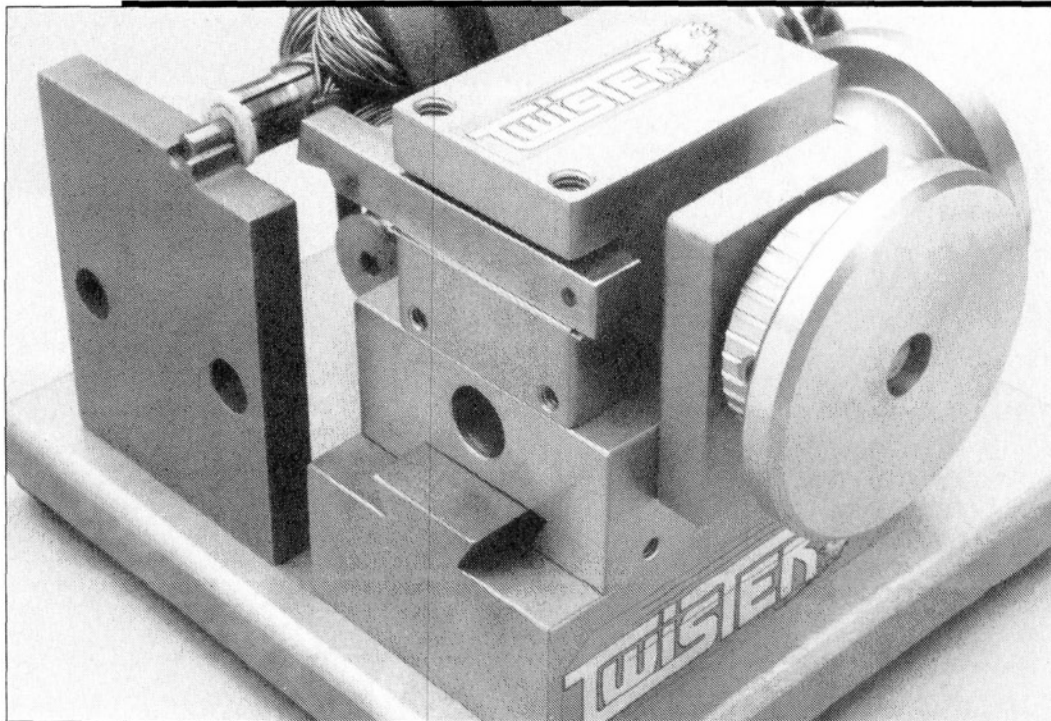
The Mini Lathe is easy to carry, yet it has all the elements you'd expect to find on a larger, more elaborate machine. Each part is precision-machined to ensure that the tolerances are as tight as possible.

Just like larger, more complex lathes, the Mini Lathe allows you to have precise control of both the carriage and the cross-feed movements. To keep the tolerances in shape, the dovetail

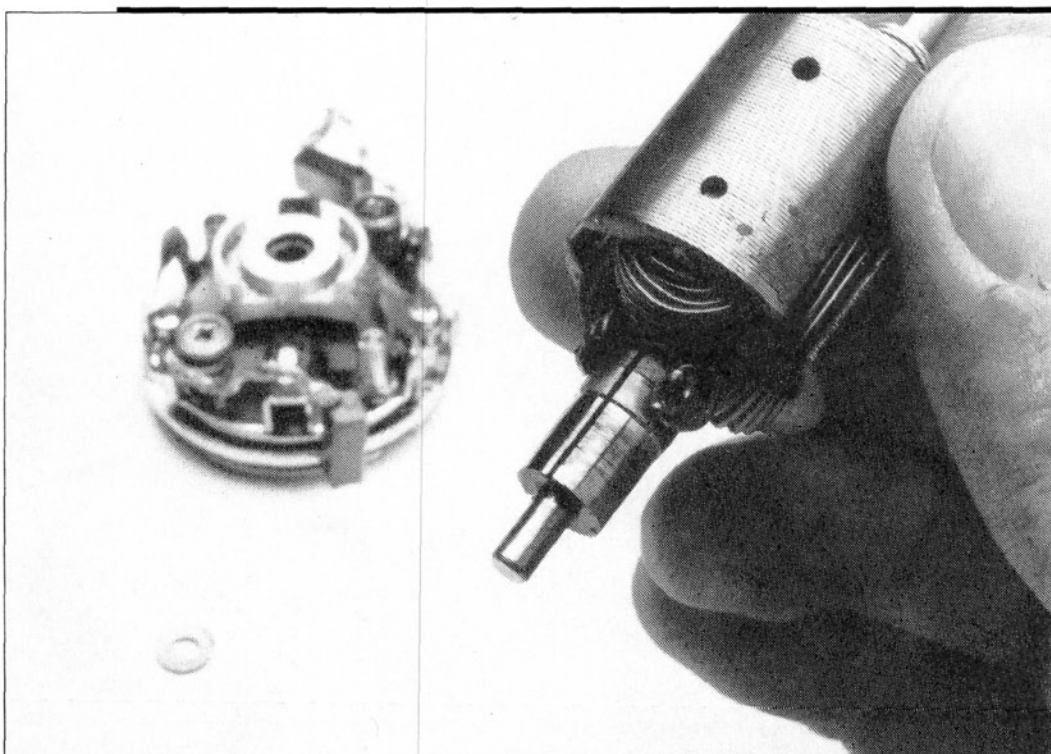


*Left: The Twister Mini Lathe boasts the highest tolerances of any available lathe. Would you believe .00005 of an inch?! Although the cost is high (as R/C accessories go), it's very reasonable for a machine with these tolerances.*

*Right: Guiding the carriage and the cross-feed are dovetail slides, which have adjustable gibs to maintain proper tolerances.*



*Right: This commutator is from a modified with roughly six runs. The black burn marks at the edge of the slots are from normal use and will eventually hamper performance.*



PHOTOS BY STEVE POND

slides (which guide the movement of the tool in both directions) have plastic gibs that act as shims; these gibs can be tightened when extended use begins to take its toll. The method used on the Mini Lathe to support the armature varies from that of the larger lathes. Instead of a three-jaw or collet chuck, the armature is supported by a pair of vertical plates that have machined slots in which the armature shaft rides.

Turning the armature is a Twister Pocket Rocket motor that has a pulley attached where a pinion gear would usually be mounted. A rubber O-ring goes around the armature and the drive pulley, spanning the armature while keeping it in the slots.

Because the lathe is pow-

ered by a 540-type DC motor, the juice has to be supplied by a battery or a power supply. In either case, the voltage *cannot* exceed 5V; more than this would cause the armature to spin too fast, and this wouldn't provide as precise a cut. Excessive voltage also increases the chance

of vibration if the armature being cut is out of balance.

The lathe comes ready to go with the drive motor installed. The only option is the diamond-cutting tool, which Twister highly recommends. A carbide bit is included, but the instructions state that the cut won't be as

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# TWISTER mini LATHE

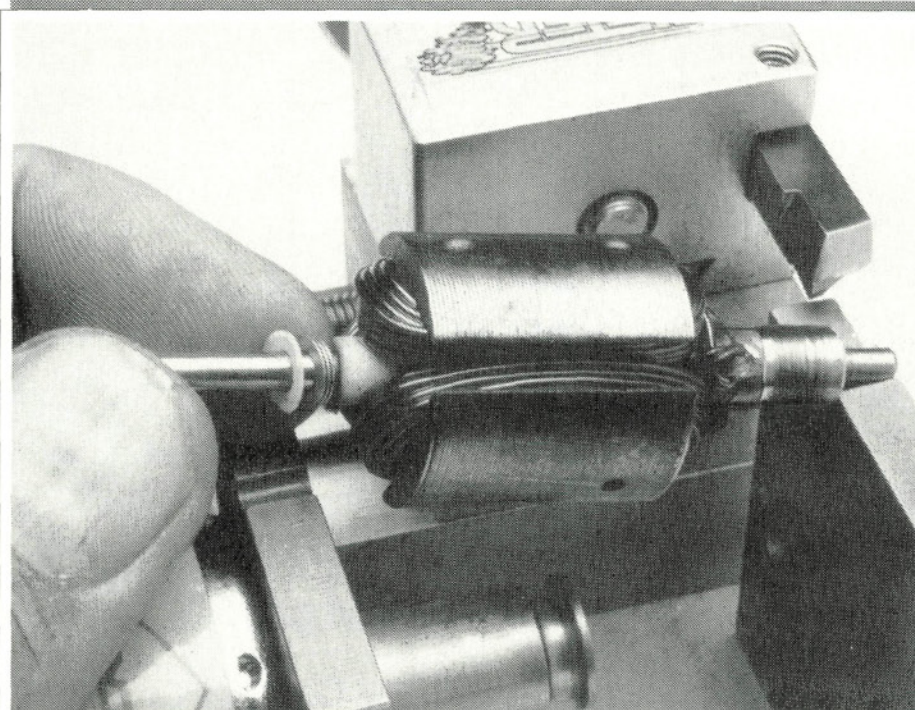
precise and the bit will require frequent sharpening. If you plan to use the lathe where there's power and a DC supply is readily available, there's no need for an alternative power source. If you plan to use the lathe at a track where power isn't available, you'll need a 4-cell battery pack.

## HOW DOES IT WORK?

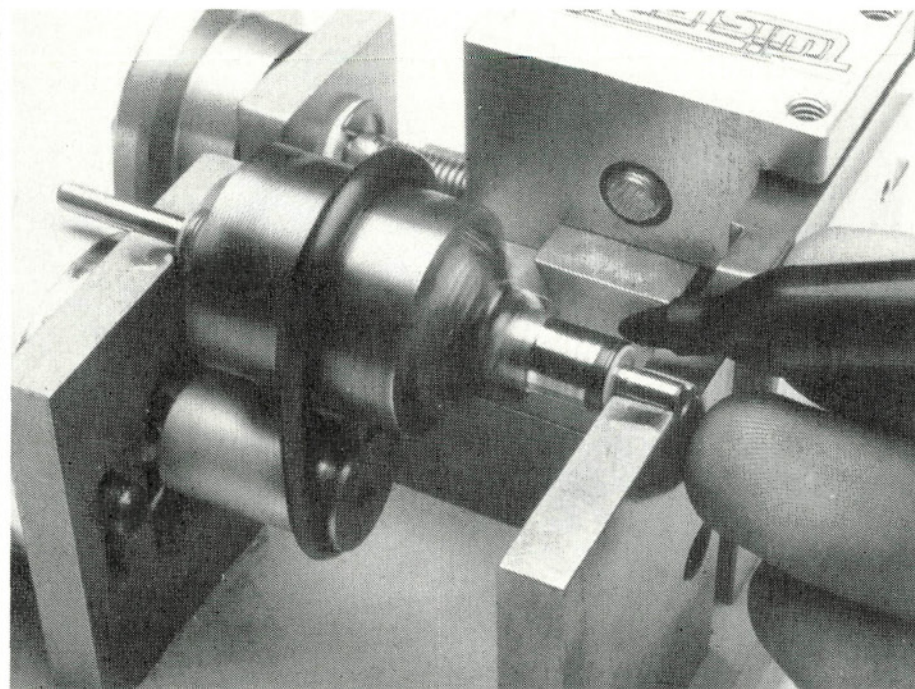
The lathe comes with complete instructions on how to cut your commutator. Here's how it works.

After removing the armature from the motor can, place it in the supports and check for side play. If the armature isn't tight between the uprights—and chances are it won't be—you must place shims (which are included) on the armature shaft to prevent any movement. The drive belt (or O-ring) is then put into place, and the commutator is ready to be cut.

Add some light oil to the armature shaft where it contacts the supports, then turn the lathe and mark the surface of the commutator to show more clearly when the bit has made contact. (The instructions recommend that you mark the commutator with a black permanent marker.) When the cutting tool makes contact with the comm, it cuts through the black ink and the shiny metal shows from underneath, so it's much easier to see. Now comes the fun part!



1. Before cutting the commutator, the armature must be shimmed to prevent side-to-side movement.



2. Just before cutting, mark the commutator with a black permanent marker; this will allow you to tell when the cutter has touched the commutator.

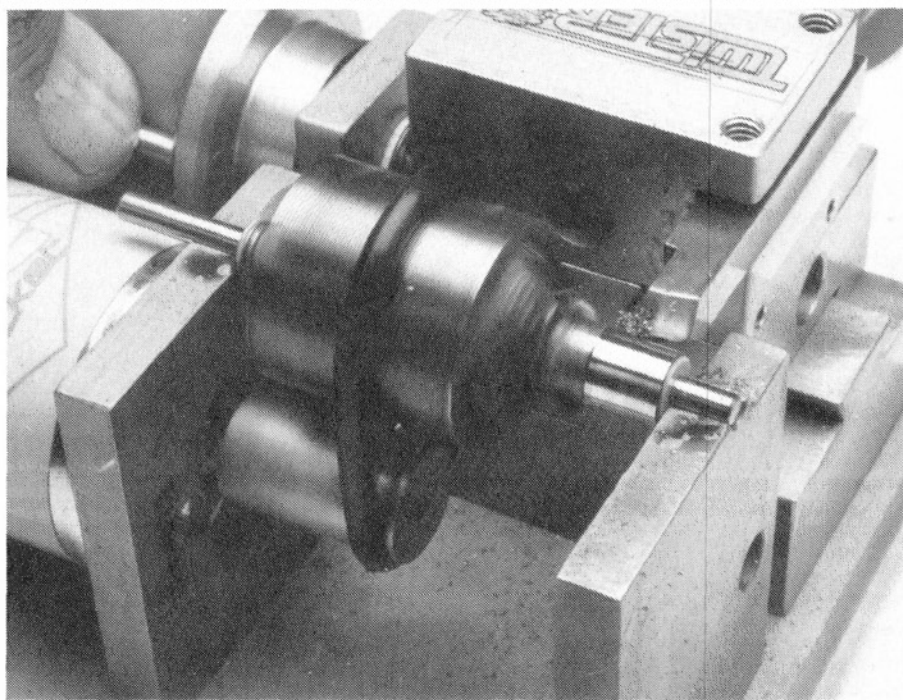
## THE CUT

To cut more smoothly, Twister recommends that you brush some light oil (e.g., WD-40) on the commutator; then all that's left is to run the cutter across the

comm. As you shave a little off at a time (about .0005 inch per cut), you can almost visualize the horsepower that will come out of the motor. The black shade from the burn marks around the slots

• • • • •





3. After applying light oil to the surface of the comm, run the cutter across it at a slow pace. The result is essentially a new motor.



4. Lightly run a ball-point pen down the slot to take the rough edges off. Note the shiny new surface on the commutator.

and the discoloration from excessive heat disappear right before your eyes. It usually takes more than one cut to complete the job, and the lighter the cut, the better the finish. After each cut, it's

wise to shut off the lathe and check the progress. When the discoloration and carbon deposits are removed, the job is finished!

To clean the metal chips from the commutator slots,

run an X-Acto blade through the slots. To remove the sharp edge, I lightly run a ball-point pen down the slot. After a good dose of motor cleaner, the motor is ready to be re-assembled and run.

Without an elaborate explanation of the benefits of having a freshly cut commutator, I'll simply say that there's a world of difference. A substantially worn motor is prone to arcing, heavy amp draw and a significant power loss. When it comes to performance, a fresh commutator is almost like having an extra cell.

Despite the small size of the lathe, it commands a hefty price (the lathe is \$249; the diamond bit is \$85.) Inevitably, this kind of precision equipment is costly, so the Mini Lathe might be too expensive for many racers. If you decide to go for it, however, you won't be disappointed with the results. It would be a good idea for a track or a hobby shop to offer its use as a service to their customers. Instead of chucking your motor, or waiting for it to come back from a re-builder, it could be revitalized in five minutes in the smallest of spaces. Who knows? You could even make up the cost by cutting a few at the track when you have some idle time!

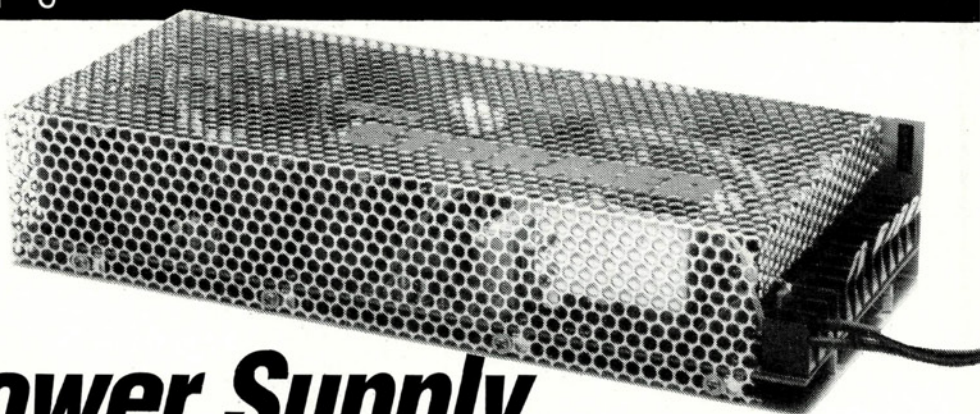
*\*Here's the address of the company featured in this article:  
Twister Motors, 657 E. Arrow Hwy., Suite H, Glendora, CA 91740.*



35Q

## Power Supply

by WALLY DAVID

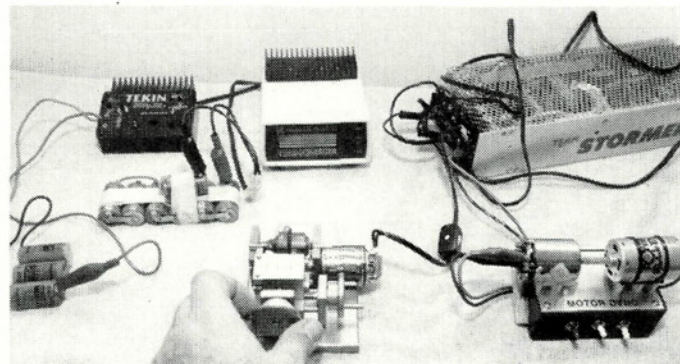
*G o b s o f a m p s !*

**I**F I SAY there's a power supply that can simultaneously run two chargers and two other pieces of equipment that need a constant 6 volts (like motor dynos or comm lathes), you'll think I'm crazy, right? You'd be wrong! Stormer Racing is the exclusive distributor of the Monolithic\* MAX-AMP 35Q, which does all of these things. The MAX-AMP 35Q has two separate 13.8V, 15A regulated DC outputs, so you can use two chargers at up to 15 amps each, and they won't interfere with each other. (No false peaks here!) Add the two 6V, 50A outputs, and you have a very versatile unit.

**LIGHT HEAVYWEIGHT**

When I first looked down at the power supply, I saw an aluminum mesh covering a mass of transformers, resistors, wires and I don't know what else. When I removed the 35Q from its box, I was amazed at its lightness. At a mere 4 pounds, it's four or five times lighter than most other "killer" power supplies, and you'll have no trouble packing this 2½x5x1¼-inch powerhouse in with your other equipment.

At one end of the power supply there's a row of screws with voltage outputs shown on labels below. The instructions recommend that you mount output jacks on top of a piece of Plexiglas and then use standoffs to mount the output board on top of the mesh cover. Wiring is run underneath and up through the mesh cover and is attached to banana plugs. Because I didn't want to change all the cords on my equipment, I chose to use the stock alligator clips. When trying to find something for the tabs to clip onto, I realized that Dan's\* Gold Bars have holes into which the screws fit—perfect! I now had tabs. Care must be taken to make sure the



The four channels on the Monolithic 35Q (two 13.5V; two 5V) allow simultaneous running of virtually all trackside accessories.

clips don't touch each other and short out the power supply.

**PUTTIN' OUT THE POWER**

The main feature of the MAX-AMP 35Q is the twin, high-output, 13.8V, 15V power supply. These two sources can each put out enough power to operate a charger that's charging a battery at up to 15 amps. (That's two chargers; not just one.)

To test the 35Q, I hooked up a Tekin\* Reflex Charger and Competition Electronics'\* Turbocharger to see what kind of power this baby could put out. The Tekin can charge up to 10 amps (although I don't recommend that you charge at over 5.5 amps for SCRs and 4.5 amps for SCEs), and that's just what it did.

Next, I cranked up the Turbocharger to charge another pack. Both chargers put out the maximum 10 amps and weren't affected by the other one shutting off. (This is a problem when two chargers are run off one power supply.)

The 6V, 50A outputs on the 35Q can be used to run motor dynos, break-in machines or comm lathes. With these two outputs, you'll no longer need to keep dyno or break-in packs charged.

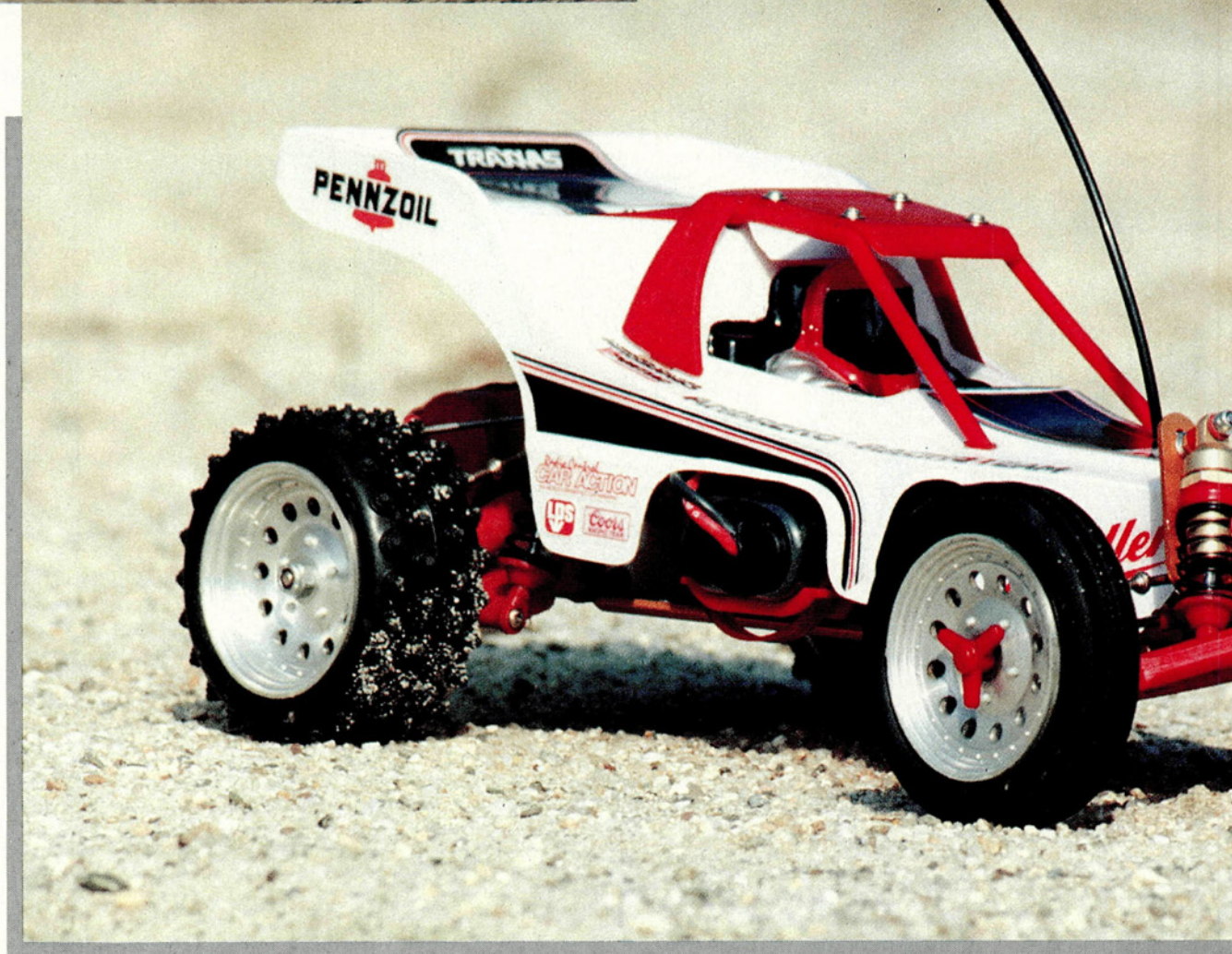
With the two chargers working, I got ready to hook-up a Stormer Motor Dyno and a Twister\* Mini Commutator Lathe. Each unit usually runs off a 4-cell pack, which will slow down after a while and need to be recharged. For precise motor-dyno readings, you'll need a consistent power source. Because the 35Q has two 6V, 50A circuits, the output never changes. So there I was truing the comm, with the two chargers putting out 10 amps each. The motor dyno was running, and everything had plenty of power.

It's incredible that the MAX-AMP 35Q could really keep everything running at full power. At an affordable price of \$169.95, it costs less than many available power supplies. You can run two chargers and two other pieces of equipment that need 5 volts, so the 35Q is an incredible value.

*Editor's Note: The MAX-AMP 35Q now comes with two 13.8V, 18A circuits.*

\*Here are the names of the companies mentioned in this article: **Monolithic**; distributed by Stormer Racing, P.O. Box 126, 23 High Speed Rd., Glasgow, MT 59230. **Dan's R/C Stuff**, 9525C Cozycroft Ave., Chatsworth, CA 91311. **Tekin Electronics**, 970 Calle Negocio, San Clemente, CA 92672. **Competition Electronics**, 2542 Point O' Woods, Rockford, IL 61111. **Twister**, 657 E. Arrow Hwy., Suite H, Glendora, CA 91740. ■





# TRAXXAS BULLET

*What's faster than a speeding bullet?—  
at my track, not much! During R/C duels,  
I shoot down the competition with the  
new 2WD TRX-10 Bullet from Traxxas\*!*





Drop-dead  
performer  
or a total  
misfire?  
Read on...!

by LOUIS ANDREKO

### BULLET CASING

The Bullet is packaged in a colorful sturdy box, and the parts are securely bagged and labeled. The 49-page manual is well-thought-out, and there are detailed diagrams for each assembly step. Three wrenches, an Allen key, shock oil and a tube of silicone grease are included in the kit. You'll have to supply Phillips screwdrivers (small and medium), needle-nose pliers, a hobby knife, side cutters and screw-locking compound.

The Bullet has impressive performance features. Its chassis is made of aircraft-grade T-6 aluminum and has contoured sides and mounting holes that are countersunk to ensure a smooth underside. This durable metal chassis acts as its own snag-free skid plate. The front suspension has an extra-wide wheel track and sway bar, which give the Bullet great stability for hard cornering and jumping. The T-6 shock-mount towers have multiple alignment holes for maximum ground



PHOTOS BY LOUIS ANDREKO

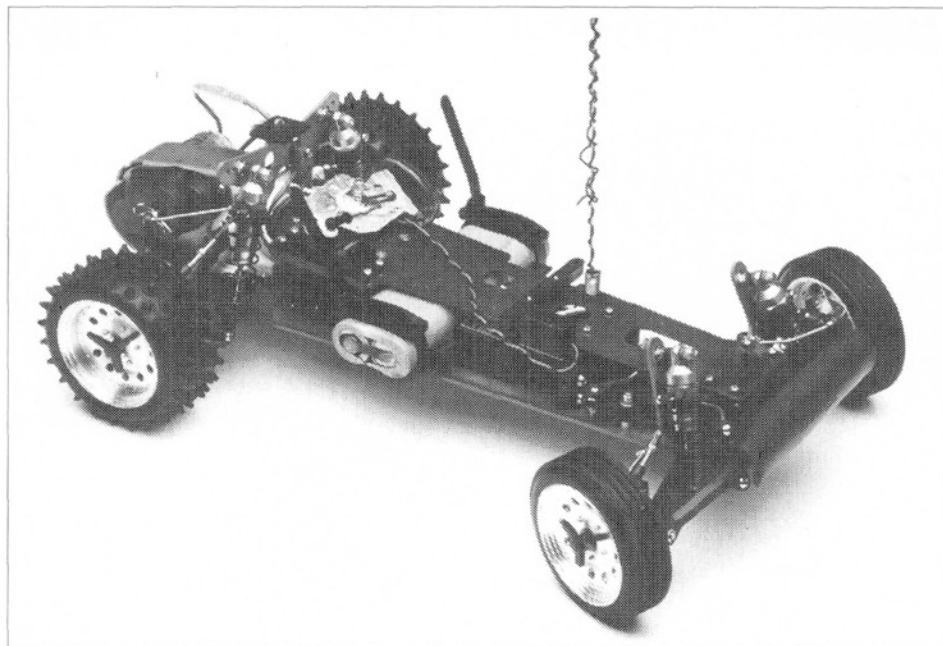


# BULLET

clearance, and the oil-filled, coil-over shocks are fully adjustable, front and rear. Shock oil of a variety of weights can be used to provide the right dampening for any track, and turnbuckles and stainless-steel ball joints are used at all critical locations to make adjustments easy.

A fiberglass radio-mounting plate runs the length of the chassis to provide protection for the electronic components, and the four-step forward-with-reverse speed control is mounted atop this plate. The battery compart-

ments and a rear sway bar. To get power to the rear wheels, variable-length splined drive shafts fitted with stainless-steel U-joints are attached to the differential. A Nichibro 7522 modified motor (not legal in ROAR



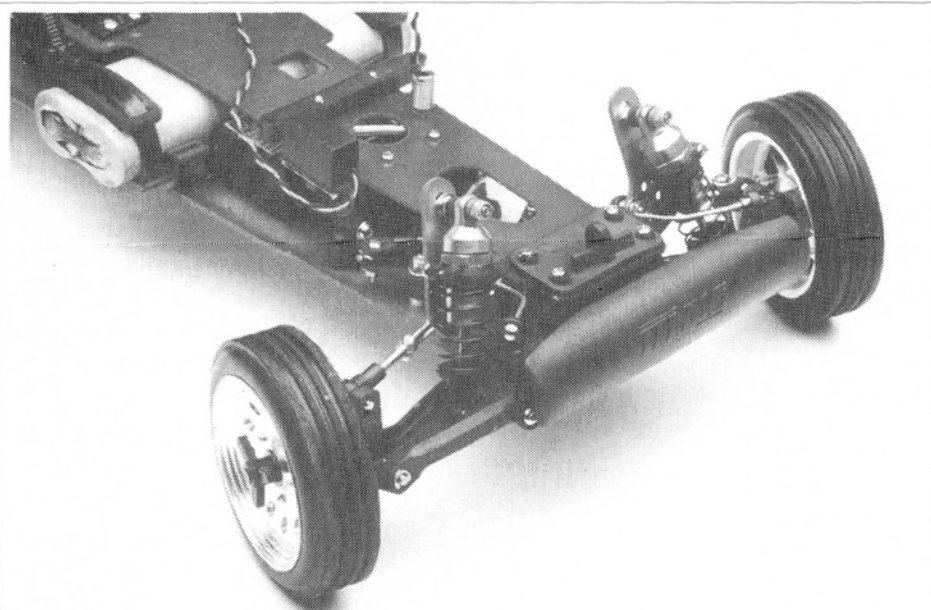
## LOADING YOUR GUN

The 191-step assembly took me several nights, but I work along with the TV, so the time flies. Assembly begins with the differential. Two metal plates (with lightly tightened screws) maintain constant pressure between the bevel gears and the internal spider gears. Traxxas provides Oilite bushings, which last longer than plastic ones and make your car run more smoothly. They can be upgraded to ball bearings, and I found that Tamiya-type ball bearings will fit the Bullet.

When I build a car, I like to add a little color to the chassis parts, so I dye them. Unfortunately, the Bullet's gearbox halves are made of a material that can't be dyed. I didn't know this, but they melted when I tried and had to be replaced. Don't over-tighten the screws in the sides of the gear case, or the transmission will bind inside, lose speed and wear out quickly.

When assembling the shocks, install a nylon washer on the piston shaft outside the shock body. This spacer prevents the piston-rod shaft from piercing the rubber diaphragm inside the shock body at full compression.

Building the rest of the kit is easy; just go step by step. I know that some kit builders jump right in at the middle and end up with extra parts or parts that don't fit, so read the directions. The Bullet kit includes an extra bag of parts, and that's a nice touch, especially for us fumble-fingered modelers! Ten points for Traxxas!



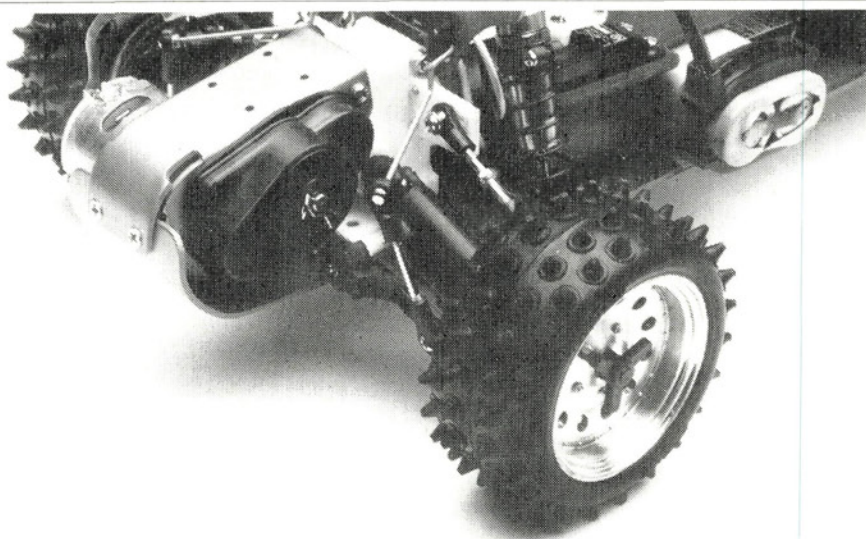
*The front end of the Bullet has strong A-arms, an anti-sway bar and oil-filled, coil-over shocks. The heavy-duty front bumper soaks up hard shots.*

ment, which uses nylon tie-down straps and rubber pads to hold the battery in place, takes a 6- or 7-cell flat-pack.

At the Bullet's rear, you'll find independent A-arms, oil-filled, coil-over

shocks and a rear sway bar. To get power to the rear wheels, variable-length splined drive shafts fitted with stainless-steel U-joints are attached to the differential. A Nichibro 7522 modified motor (not legal in ROAR competition) is provided in the kit. The gearbox has a removable dust cover with a rubber sealing gasket; this gives you easy access to the motor for pinion-gear ratio changes.



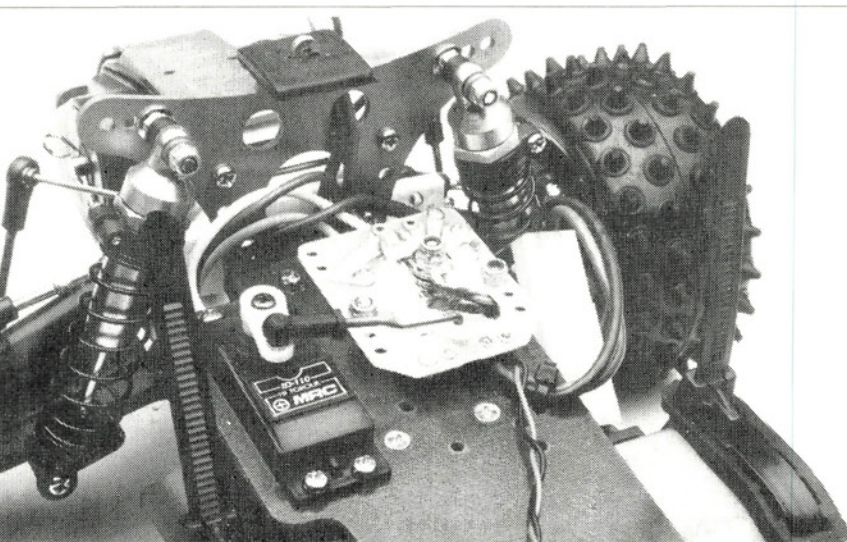


## RIGHT ON TARGET

With the Bullet complete and all its moving parts oiled, I headed to the local track for a test run. Two hot, local, off-road drivers were practicing—Frank Masi and Jim Corbit—so I asked them to drive the Bullet while I shot some pictures. Knowing the track's layout, I had set up the Bullet's suspension with the shock-oil weight and gear

ance over the jumps and moguls and around tight corners—and that was without ball bearings! Unfortunately, the Bullet is a little on the heavy side and should lose some weight to be more competitive.

I hear that Traxxas has a new graphite chassis and graphite front and rear shock towers for the Bullet. These parts, along with a full set of ball bear-



*The Traxxas Bullet comes with the resistor-type speed control (shown here) that works well with the stock motor. If modified motors are on the menu, however, an electronic unit is recommended.*

ratio that I use in other off-road cars for this track.

Living up to its name, the Bullet took off, flew over the jumps and landed cleanly! Frank, Jim and I were impressed with the Bullet's perform-

ings, an electronic speed control and a high-speed servo, should turn the Bullet into a rocket!

*\*Here's the address of the company mentioned in this article:*  
**Traxxas Corp., 12150 Siloh Rd., #120, Dallas, TX 75228.** ■

# TRAXXAS

## BULLET

Type ..... Off- or on-road  
Scale ..... <sup>1</sup>/<sub>10</sub>  
Sug. Retail Price ..... \$165

**DIMENSIONS:**

Overall Length .....	15.50 inches
Width .....	9.25 inches
Height .....	5.75 inches
Wheelbase .....	10.75 inches
Front Track .....	9.25 inches
Rear Track .....	9 inches

**WEIGHT:**

Gross (w/bat.) ..... 56 ounces

**BODY:**

Type ..... Off-road  
Material ..... Polycarbonate

**CHASSIS:**

Type ..... Monocoque  
Material ..... T-6 Aluminum

**DRIVE TRAIN:**

Primary .....	Pinion/spur
Transmission .....	Gear drive
Differential .....	Gear diff
Bushings .....	Oilite bushings

**SUSPENSION:**

Type (f/r) ..... Lower A-arm/  
upper control link  
Dampening (f/r) ..... Oil-filled, coil-over  
shocks

**WHEELS:**

Front: Type ..... 3-piece plastic  
Dimensions (DxW) ..... 2.25x.75  
inches

Rear: Type ..... 3-piece plastic  
Dimensions (DxW) ..... 2.25x1.50  
inches

**TIRES:**

Front ..... Ribbed  
Rear ..... Pin-spike

**ELECTRICS:**

**Motor** ..... Nichibo 7522 modified  
**Battery** ..... 6- or 7-cell flat pack\*  
**Speed Controller** ..... Four-step forward/  
reverse

**OPTIONS AS TESTED:**

MRC Top Gun Radio system, 6-cell SCR flat-pack battery.

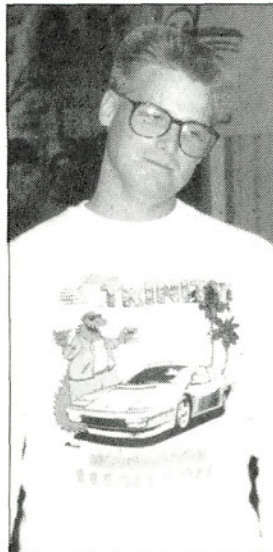
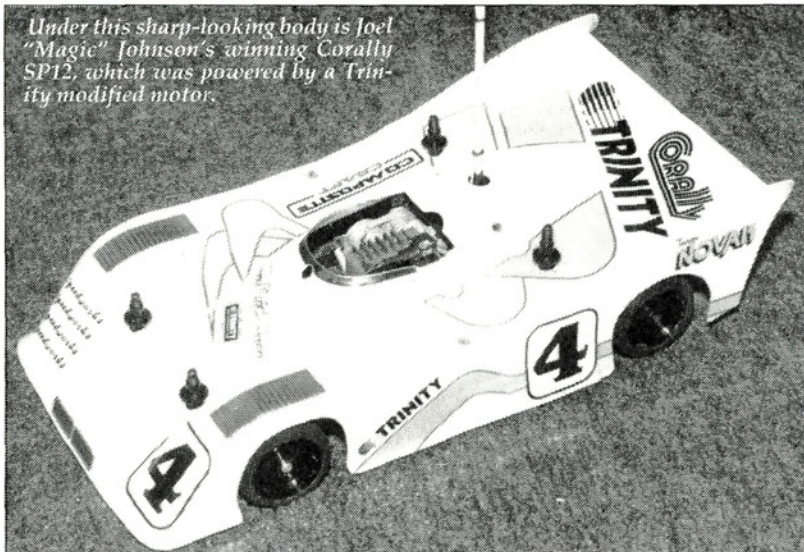
**COMMENTS:**

The Bullet is well-built; adjustments are easy and quick; and the nylon suspension parts are strong. Although it's on the heavy side, it can be trimmed down for serious competition. The Bullet is also available pre-assembled with a Traxxas radio and an electronic speed control, but the kit is an enjoyable challenge.

\*not included



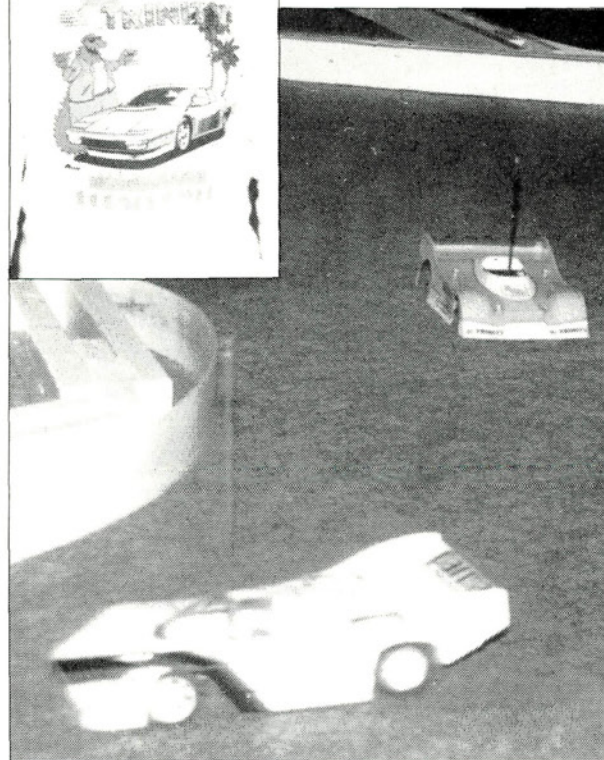
Under this sharp-looking body is Joel "Magic" Johnson's winning Corally SP12, which was powered by a Trinity modified motor.



Left: Johnson ran away and hid in the Modified A-Main.

Below: A Parma Porsche-bodied car sweeps through a turn; another car is close behind.

PHOTOS BY ERIK SODERQUIST



# GR WINTER CHAMPS

## "MAGIC'S" CARPET RIDE!

by ERIK SODERQUIST

**O**NCE AGAIN, the Grand Rapids Marriott was overrun by a band of transmitter-toting, tire-smoking R/C racers! It was time for the Grand Rapids Rivertown Racers' (GRRR) Third Annual Grand Rapids 4-Cell Winter Championships!

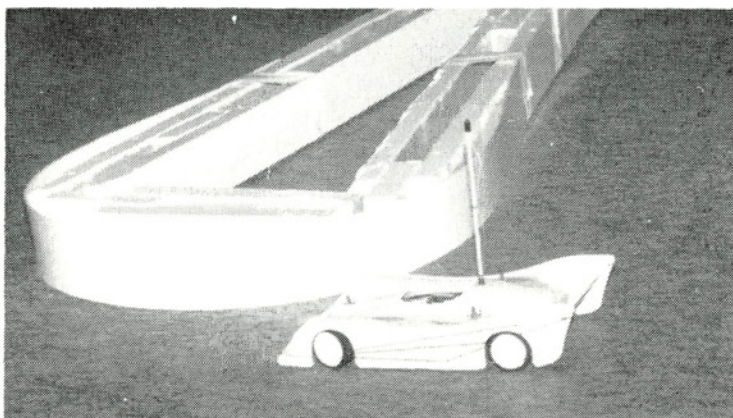
### TRIPLE CROWN PRESTIGE

This year's competition was particularly exciting, because it was chosen as the second race in the Sanyo Triple Crown. (The first leg was the U.S. Indoor 4-Cell Championships held in Cleveland, and the final will be the ROAR 4-Cell Nationals hosted by SEMMROC in Detroit.) The added prestige of the Triple Crown allowed the Rivertown Racers to sign up some big names, including Tony Neisin-

ger, "Magic" Johnson, Bob Light, Chris Doseck and Bud Bartos. This group, along with some up-and-coming stars, provided unforgettable action.

Even though track construction the night before prevented most of us from getting a full night's sleep, practice began at 8 o'clock sharp Friday morning. Because the track was rough, drivers spent a lot

of time dialing-in their cars and getting accustomed to the track; then, they unleashed the horsepower!



The Corally SP12 of 2nd-qualifier and 2nd-finisher Chris Doseck is caught in action.

### S T O C K

FIN	QUAL	NAME	CHASSIS	MOTOR	ESC	BATTERIES	BODY	TIRES (f/r)	TRACTION COMPOUND
1	8	Keith Hamilton	Associated 12L		Novak	Gonzo	TOJ	TRC Green	Paragon Ground Effects
2	2	Jon Orr	Corally SP11	H	Corally	Class	TOJ	PD Posi-Trac	Paragon Ground Effects
3	3	Joe Fitzpatrick	Agitator 12	A	Novak	Team Smooth	TOJ	Boss Racing	Paragon Ground Effects
4	7	Jack Kloeber	Delta Spyder	C N	Head	A&D Racing	TOJ	Twinn-K Green	Twinn-K
5	5	John Pens	Corally SP11	A D	Novak	Team Smooth	TOJ	PD Posi-Trac	Paragon Ground Effects
6	1	Chuck Lonergan	Associated 12L	M -	Tekin	Advantage	TOJ	Boss Racing	Paragon Ground Effects
7	6	Bill Schoenau	Corally SP12	O	Corally	Team Smooth	TOJ	PD Posi-Trac	Paragon Ground Effects
8	10	Chuck Sommers	Agitator 12	U	Novak	Sanyo SCE	TOJ	TRC Green	Paragon Ground Effects
9	9	Dean Smith	TQ Eagle	T	Novak	Power Pushed	TOJ	Yokomo	Paragon Ground Effects
10	4	Aaron Treppa	Corally SP11		Tekin	Peak Perf.	TOJ	PD Posi-Trac	Paragon Ground Effects





Linda Carrubba and Ted McCarthy kept things running smoothly.

The fastest drivers in Stock practice were John Pens, Bill Schoenau, Chuck Lonergan and Joe Fitzpatrick. In the Modified class, Andy Dobson and Joel Johnson of Team Trinity virtually tore up the track! Hot on these veterans' heels were "new kids on the block" Louis LeBlanc (Agitator/Twister) and Mike Blackstock (Associated/Reedy).

## DUSK TO DAWN

Qualifying began early Saturday morning. In the first round of Stock qualifying, Chuck Lonergan blistered the track with 39 laps in 8:11. Almost half a lap back, John Pens and Chuck Sommers came in 2nd and 3rd, respectively. In Modified, the first round was the "Chris Doseck (Corally/Cam) Show." His run of 42 laps in 8:09 put him on top; Joe Lawrence (Agitator/Peak Performance) and Louis LeBlanc qualified 2nd and 3rd, respectively.

In round two, the Stock Class tightened up: while Chuck Lonergan bettered his TQ time to 39/8:08, three drivers made the competition more interesting: John Pens (39/8:08), Bill Schoenau (39/8:11) and Jon Orr (39/8:12). Round two was

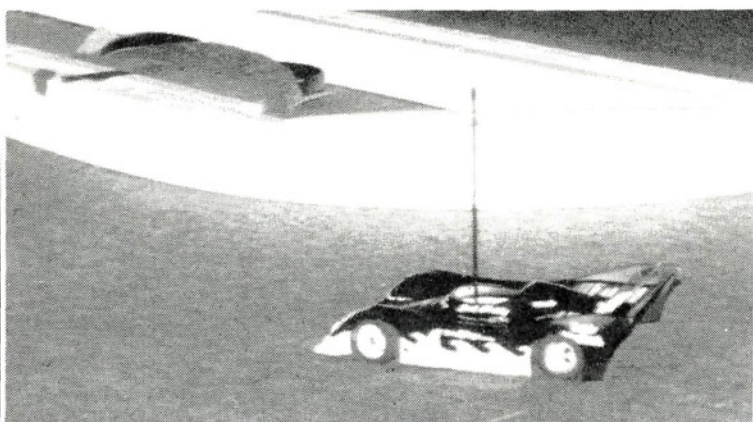
rather uneventful for the top three Modified drivers, as they weren't able to better their times. Mike Blackstock and Bill Jeric (Associated/Twister) did improve, however—to the 5th and 6th positions—with times of 41/8:05 and 41/8:06, respectively.

There were some major shakeups in the third round of the Modified Class. Mike Blackstock scorched the track and took the top slot with a run of 42/8:03. Chris Doseck improved his time but fell 6 seconds short of Blackstock with a 42/8:09. Chuck Lonergan, who improved his time to 39/8:04, continued to dominate the Stock Class. Other movers were Aaron Treppa (now 2nd) and Jack Kloeber, who took 4th.

We went to bed very late—a tradition in indoor racing. It seemed as though I'd only slept 5 minutes when I heard the

dreaded wake-up call—time to start another long day! On Sunday, the final round of qualifying was held. In recognition of his hard work at all the 4-cell Winter Champs, Ted McCarthy (President of the host GRRR club) was given a plaque.

The final qualifying round featured some inspiring driving by Seniors' Tour member Bill Jeric. A long-time veteran of the sport, Bill pulled off a "run of old" to join fellow Seniors' Tour member Carl Christy (Associated/Reedy) in the A-Main. The only shakeups at the top of the Modified Class involved Louis LeBlanc, who motored into the 3rd qualifying position, and Joel "Magic" Johnson (Trinity/Corally), who eased into 4th. After the final round, the top five qualifiers were: Mike Blackstock, Chris Doseck, Louis



Team Associated and Team Ugly share the driving services of Carl Christy, who finished 6th in the Modified A-Main.



Members of the Grand Rapids Rivertown Racers assemble the 1/12-scale track in the ballroom of the Grand Rapids Marriott Hotel.

## MODIFIED

FIN	QUAL	NAME	CHASSIS	MOTOR	ESC	BATTERIES	BODY	TIRES (f/r)	TRACTION COMPOUND
1	4	Joel Johnson	Corally SP12	Trinity	Novak	Trinity	TOJ	Trinity Magic Rubber	Trinity Green Dot
2	2	Chris Doseck	Corally SP12	CAM	Novak	CAM	TOJ	PD Posi-Trac	Paragon Ground Effects
3	3	Louis LeBlanc	Agitator 12	Twister	Novak	Team Smooth	TOJ	PD Posi-Trac	Paragon Ground Effects
4	5	Joe Lawrence	Agitator 12	Peak Perf.	Tekin	Peak Perf.	TOJ	Boss Racing	Paragon Ground Effects
5	7	Bill Jeric	Associated 12L	Twister	Novak	Power Push	TOJ	Twinn-K/Trinity Magic Rubber	Paragon Ground Effects
6	10	Carl Christy	Associated 12L	Reedy	Novak	Reedy	TOJ	Yokomo	Paragon Ground Effects
7	6	Mike Seubert	Corally SP12	Wimpy	Novak	Gonzo	TOJ	PD Posi-Trac	Paragon Ground Effects
8	9	Tony Neisinger	Corally SP12	Trinity	Tekin	Trinity	TOJ	Trinity Magic Rubber	Trinity Green Dot
9	8	Chad Coppock	Associated 12L	Wimpy	Novak	Gonzo	TOJ	TRC Green	Paragon Ground Effects
10	1	Mike Blackstock	Associated 12L	Reedy	Novak	Reedy	TOJ	PD Posi-Trac	Paragon Ground Effects



# GR WINTER CHAMPS

LeBlanc, Joel Johnson and Joe Lawrence.

Consistently improving his time, Chuck Lonergan capped off his final run by breaking the elusive 40-lap barrier with a 40-lap, 8:12 run! Jon Orr leaped into the 2nd spot with a 39/8:06, while Joe Fitzpatrick found some horsepower and slid into 3rd with a 39/8:07. On the strength of his third-round performance, Aaron Treppa captured the 4th qualifying spot, and rounding out the top five was John Pens.

With the Mains set, the crowd assembled. Introductions were made; John Thawley assumed his customary microphone position; and the Stock A-Main was underway.

## TEARING UP THE TRACK

At the sound of the horn, TQ Chuck Lonergan bolted off the line with the kind of power that many modified racers would have envied, and John Orr and Joe Fitzpatrick were right behind him. Two-and-



*Louis LeBlanc relaxes while painting a body for his Agitator 12. A 3rd-place finish in Grand Rapids and a 2nd in Cleveland put him second overall in the Triple Crown points, just one point behind Joel Johnson.*

lead over Jon Orr's 2nd-place car, while John Pens made his way by Kloeber.

Lonergan looked like a sure winner until the unthinkable occurred: he began to dump! With about 10 seconds to go, Lonergan was almost parked, and Jon Orr went by him, followed closely by Keith Hamilton. On the last lap, Hamilton slipped by Orr to finish 1st, and Joe Fitzpatrick came in 3rd. The margin of victory?—a mere .8 seconds! In fact, the top four finishers in the Stock Class were within 2.25 seconds of each other.

## AND THE WINNER IS...?

After a short breather and a quick check



*Trinity's Joel Johnson imparts some driving wisdom to ROAR Administrator John Thawley.*

a-half minutes into the race, Keith Hamilton made a bid for 3rd and passed Fitzpatrick. In all the commotion, Jack Kloeber slipped into 4th and pushed Fitzpatrick back to 5th. At the 3:30 mark, Hamilton and Fitzpatrick tangled, and this allowed Kloeber and John Pens to slide into 3rd and 4th position. Lonergan stretched his

of the pace makers, it was time for introductions of the modified A-Main. A mix of crafty veterans, Seniors' Tour representatives and newcomers made this Main very interesting.

At the sound of the horn, Mike Blackstock flew into the lead, followed by Chris

*(Continued on page 78)*

## THE SANYO TRIPLE CROWN

**S**EVERAL YEARS AGO, organizers wanted to link the three, major, indoor 1/12-scale races into a major championship. The idea wasn't taken seriously...until now. With the backing of Sanyo, ROAR Administrator John Thawley has orchestrated the logistics and given us the Sanyo Triple Crown.

This three-race series includes the "biggest" 1/12-scale, 4-cell races of the year: the U.S. Indoor Championships, the Winter Championships and the ROAR 4-Cell Nationals. Now that the first two have been completed, the stage is set for the final in Detroit!

Points are awarded based on the driver's finishing position:

### A-Main

1st .....	500
2nd .....	499
3rd .....	498
4th .....	497
5th .....	496
6th - 10th .....	495

### B-Main

1st .....	494
2nd .....	493
3rd .....	492
4th .....	491
5th .....	490
6th-10th .....	489

### Current Standings in the Sanyo Triple Crown:

#### Modified

Joel Johnson .....	998
Louis LeBlanc .....	997
Andy Dobson .....	994
Chris Doseck .....	994
Tony Neisinger .....	992
Joe Lawrence .....	992
Mike Blackstock .....	991
Carl Christy .....	989
Bob Light .....	988
Bill Jeric .....	988

#### Stock

Jon Orr .....	995
Bill Schoenau .....	995
Jack Kloeber .....	994
John Pens .....	994
Chuck Lonergan .....	994
Dean Smith .....	990
Joe Fitzpatrick .....	989
Keith Hamilton .....	988
Jim Keserich .....	986
Mike Walpole .....	981

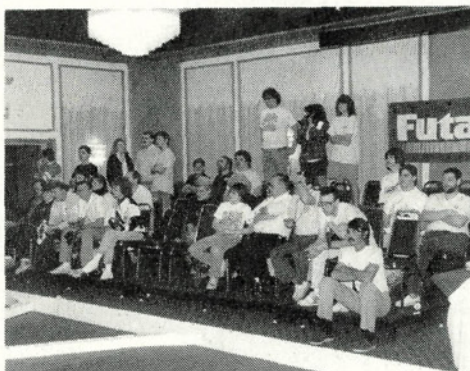


# GR WINTER CHAMPS

Doseck and "Magic Man" Joel Johnson. Doseck fought a board, lost and fell back in the pack, and this put Louis LeBlanc into 3rd. At the 30-second mark, Magic went around Blackstock for the lead, as Blackstock tagged a board and tapped LeBlanc. Blackstock maintained 2nd place, but LeBlanc fell back and Joe Lawrence blew by him into 3rd. Lawrence then took off after Blackstock and passed him at the 3-minute mark. Meanwhile, Johnson was gone! After a miserable start, Doseck managed to fight his way back up to 4th.

At the 6-minute mark, a fight developed

for 2nd, 3rd, 4th and 5th place. Doseck and LeBlanc reeled in Blackstock and Lawrence and put on the pressure. Blackstock tagged a board, and then LeBlanc allowed Doseck to slip into 2nd. Lawrence filed in behind for 3rd, while Black-



A good-size crowd watches the action in the Marriott ballroom.

stock dropped to 4th. Magic Man was still way out in front!

With 7 minutes down, it was "crunch time" for the batteries. Johnson was still motoring along just fine, and so was Doseck. Blackstock was not as fortunate, and when he dumped heavily, LeBlanc and Lawrence were able to get around. With only 10 seconds to go, LeBlanc made a daring outside move on Lawrence and captured the 3rd spot. Johnson had begun to slow way down, but he crossed the finish line to take the win, followed by Doseck and LeBlanc.

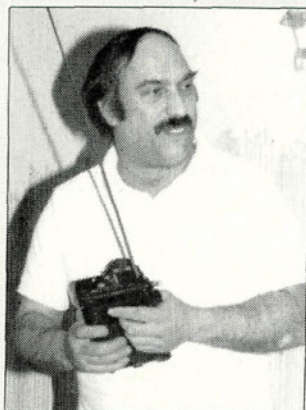
Magic Man returned to the Winner's Circle after a long drought, but this race showed that there's a breed of young drivers ready to challenge the supremacy of the legends of 1/12 scale. What do the World Championships hold in store?! ■

## KWAZY WABBIT WACE

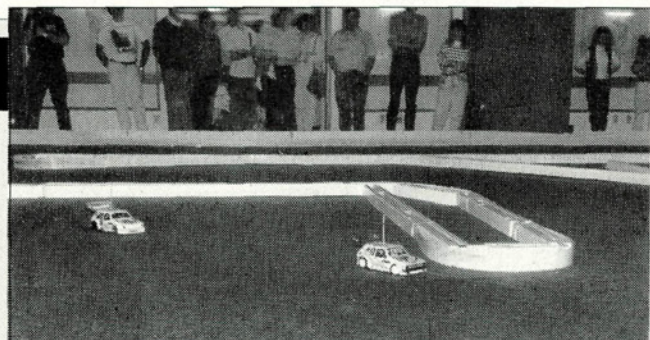
**B**ETWEEN THE FINAL qualifying round and the start of the Mains, there was a race like no other—a race to end all races; a race to prove who could have the most fun—Bud's Kwazy Wabbit Wace!

Sponsored by Bud's Racing Products, this race pitted past winners of the Winter Champs against the current champions of the U.S. 4-Cell Indoor Championships. For good measure, John Thawley (ROAR National Administrator), Ted McCarthy (Race Director) and Tate McDaniel (owner of CAM Motors) were invited to participate. Jake Myers was chosen randomly as the 10th and final entrant in this most prestigious contest.

Each car was equipped with matched Power Pushed batteries, CAM Stock motors and a



Power Pushed owner Tony Carrubba watches his car en route to victory in the Kwazy Wabbit Wace.



All the cars in the Kwazy Wabbit Wace used Volkswagen Rabbit bodies from Bolink.

Bolink Volkswagen Rabbit body—yes, Volkswagen. The best lap each individual attained during a 2-minute preliminary run determined his qualifying position.

The grid was set, and everyone was ready to go. Just as the race was about to start, though, the announcer threw a hitch in everybody's plans. He had all the cars turned around and told the drivers they were to race the course backwards!

The horn sounded...and the crashes began! First to escape the havoc was Bill Schoenau, followed closely by John Thawley. John soon blew by Bill and extended his lead. It was incredible! He was showing off by driving with the transmitter behind his back, under his leg, over his shoulder, even steering with his feet! As it turned out, Joel Johnson was hiding behind a video camera off to the track's side, and he was doing the driving! After Joel was exposed, John assumed control of his Rabbit...and quickly descended to where he should have been in the standings!

While John was falling, Tony Carrubba (owner of Power Pushed) assumed the lead. With some outside help—in the form of track cutting—Tate McDaniel moved into second position. This worked well until someone reached onto the track and snatched up his car! So much for Tate! The horn sounded, and the race ended with Tony Carrubba in 1st, Bud Bartos in 2nd and Andy Dobson in 3rd.

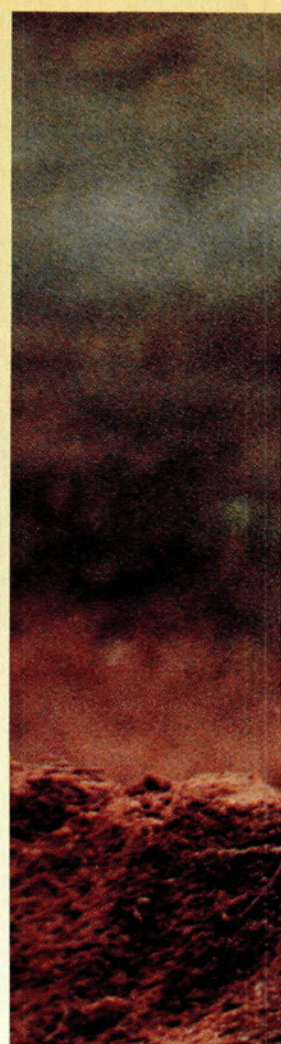
I think everyone who watched or participated in Bud's Kwazy Wabbit Wace looks forward to the next one. How about a series, Bud?

Fin	Driver	Laps
1	Tony Carrubba	21
2	Bud Bartos	21
3	Andy Dobson	21
4	Ted McCarthy	20
5	Dwight Smith	20
6	Tate McDaniel	20
7	Jake Myers	19
8	Bill Schoenau	17
9	John Thawley	5
10	Chris Doseck	3





■ Above: With a blip of the throttle, dirt rooster-tails are kicked up off the rear tires. ■ Left: Flight time and run time are no problem for the gas-powered RC10. ■ Right: Even with the added weight in the rear, the RC10 gasser is a level flier.



# HIGH-OCTANE

# 10

# 6

# ER

# WHAT

by DAVE HUDSON

I'VE RACED RC10s, Ultimas and several Tamiya off-road electric cars, competitively and for fun, but I wanted more track time without the hassle of charging batteries and cooling motors. I decided to check out the 1/10-scale nitro-burning Kyosho\* Assault.

## AGGRAVATED ASSAULT

I was impressed by the Assault's power. After it was broken in, the engine revved freely to maximum rpm (20,000). Equally impressive was

the ability of the gearbox, clutch and rear suspension to transfer that rpm to the ground.

Unfortunately, there were some problems. The front suspension was disappointing, regardless of the set-up (spring tension, dampening oil and the angle of front suspension arms). Instead of soaking up bumps, it skimmed over them, and I had to coast through turns to stay on track. To make matters worse, the rear-mounted engine made the weight distribution less than ideal: it caused the front





PHOTOS BY DAVE HUDSON

# A G A S !

end to lift under acceleration and to land front-end-high after jumps. In both cases, the starter cone hit the ground, and the engine stalled. Furthermore, within the first lap of the track, the stock, foam air filter became coated with dust and debris.

To drastically improve handling and stability and to make the Assault competitive with electric cars, some serious changes were in order. I decided that the legendary Associated\* RC10 front suspension and the powerful Assault drive train would

make an excellent combination.

## ASSAULT & BATTERY

Reluctantly, I more or less cut my Assault in half;

with every stroke of the hacksaw, I had to reassure myself that this car was going to handle much better! I trimmed some of the back of the RC10 chassis;





then I aligned, clamped, drilled and bolted the two chassis together.

To improve weight distribution, I lengthened the wheelbase by  $\frac{3}{4}$  inch and took advantage of the space in the RC10's pan chassis to reposition all the components as far forward as possible. Hats off to Associated—another example of the RC10's versatility!

To complete the conversion, I needed several fabricated aluminum parts. Depending upon the rigidity of the parts required, I used thicknesses ranging from  $\frac{3}{32}$  to  $\frac{3}{16}$  inch. To keep weight to a minimum, I added lightening holes wherever possible. To accommodate the throttle servo and to provide a convenient location for the radio

switch, I constructed a new servo plate from  $\frac{3}{16}$ -inch aluminum.

I mounted a new fuel-tank support next to the throttle servo. (The steering servo that used to be here was now in the same place as those in the RC10.) To use RC10 rear shocks, I needed a taller shock tower. This shock tower used the stock lower mounting position and required a support on the top for the tower. The tower doubles as a mount for an air box (more on that later), and it has three lightening holes that correspond to vent holes in the bottom of the air box. (Love those dual-purpose parts!)

I also made a skid plate, which bolts to the rear frame and provides excellent protection for the starter cone. To the skid plate, I added a length of Tamiya\* rollover bar, which was shaped to prevent the muffler from hitting the ground and the outlet

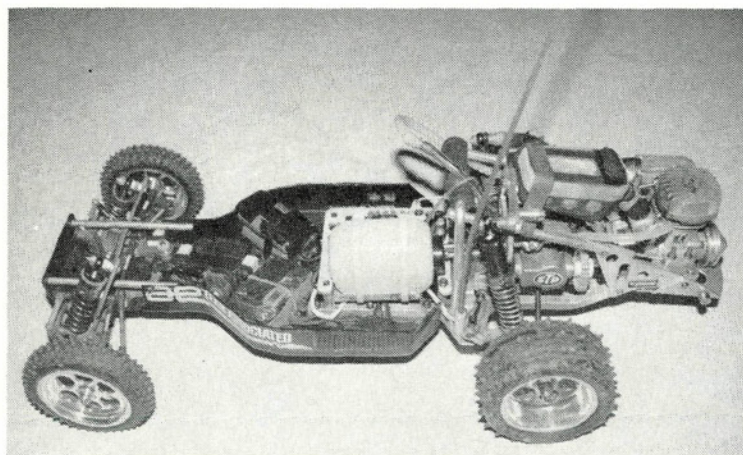
from being plugged with dirt. The muffler guard is mounted in holes that were drilled through the skid plate directly below the starter cone. (I used the collars from the discarded stock steering linkage.) The guard bar reinforces the skid plate, so it won't bend up into the starter cone.

## A BREATH OF FRESH AIR

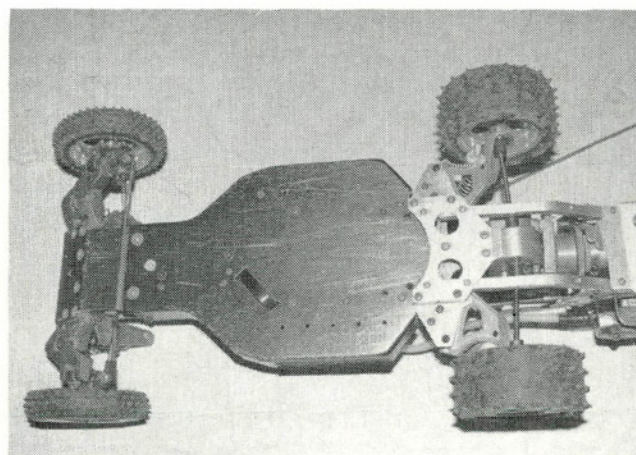
The next area that needed attention was the air-filtration system. To allow the O.S.\* CZ engine to "breathe" more easily (i.e., larger volume and cleaner air), I made an air box from a plastic air-rifle pellet container and lid. I drilled vent holes on the top, bottom and both sides, and I lined the box with the stainless-steel screen that's used in auto paint straining. I positioned this box atop the shock tower support; this keeps it high under the back of the body and out of dirt's way. To replace

the stock, foam air filter, I soldered a  $\frac{1}{4}$ -inch copper elbow into the end of a Kralinator no. G93 (or the equivalent GM part) paper fuel-filter element. This filter is mounted on the carburetor with a piece of  $\frac{1}{4}$ -inch i.d. automotive rubber fuel line. A hose clamp secures the fuel line to the copper elbow.

Before installing the air filter, I lined the air box with  $\frac{1}{4}$ -inch-thick open-cell foam (which you can buy from most upholstery shops), and I put more foam on top before adding the lid. (To seal out dirt, the air box has Velcro closures in the rear and rubber bands on the front and around the lid.) Consequently, the air that the engine "breathes" must pass through the screen (which traps large debris) and the foam pre-filter before penetrating the air filter. I can burn five tanks of fuel before I have to replace the foam pre-filter. After running the car, the



*There's no mistaking this RC10 for just another electric off-roader!*



*The Associated and Assault halves are bolted together just in front of the rear tires.*



paper element is cleaned with methyl alcohol.

## FINISHING TOUCHES

The Assault's O.S. CZ engine works best when fuel is delivered under pressure (see "Dirt Digest" in the February '89 issue of *Car Action*). A silicone hose, connected to the front of the muffler by a Du-Bro\* pressure fitting, is used to pressurize a 2-ounce Du-Bro fuel tank. (The smaller stock tank leaked when pressurized.) This tank has a clunk-type weighted fuel pickup (used in model aircraft to permit inverted flight), and this allows the engine to be fed fuel even if the car flips upside down, so the car won't have to be restarted after it's marshalled.

The pressure line from the muffler doubles as a quick-fill fuel hose. It uses a more rigid plastic fuel tubing (from the tank) and a blue electrical wire splice as a joint (half the plastic on the splice

trimmed away to fit inside the plastic tubing). The silicone pressure hose then slips over the flared end of the splice. With a length of silicone fuel tubing attached, the stock Assault filling bottle can also slip over the flared joint for fueling without removing the body. To prevent loading the engine with raw fuel, pinch the fuel line when filling.

To further enhance performance and durability, I used a Team Losi\* ball-bearing-supported steering bellcrank, a Kimbrough\* servo-saver and a set of 2-inch aluminum wheels with Cat rear spikes and full spike front rubber. To eliminate play and prevent premature wear of the outdrives, dogbones and axles, I used shims on the outdrives and the rear axles, and washers on the rear suspension-arm pivot pins.

I replaced all the stock bushings with ball bearings (a total of 21, includ-



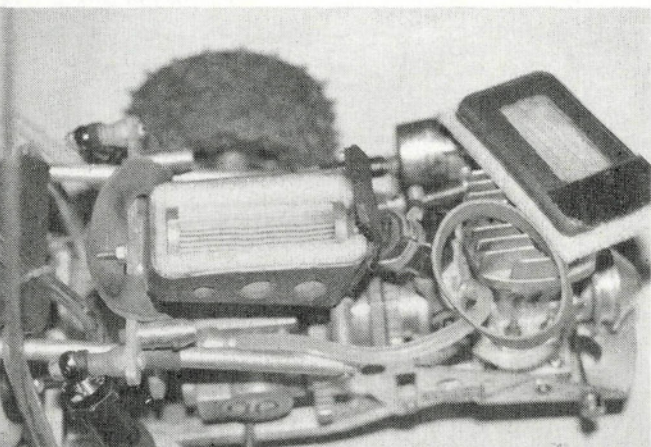
*With a quick squeeze of the fuel bottle, Hudson's gasser is ready to hit the track again, while the electrics sit and charge!*

ing three Tamiya 850 bearings on the engine pilot shaft, which replaced the stock needle bearings and bearing race to reduce clutch-bell friction.) Set-screw depressions drilled in the small, bevel gear and final pinion-gear shafts prevent misalignment caused by gear slippage. For gearbox lubrication, I used one teaspoon of STP Oil Treatment with a few drops of Power-up friction reducer. To properly align the clutch bell and the counter gear, I elongated the holes in the motor mounting plate, and to mount the

motor, I used larger Du-Bro hex-key bolts. To prevent exhaust leaks and to keep the engine clean, I used gaskets at the muffler mount and to replace the muffler baffle.

The RC10 body still fits perfectly. A Bud's\* off-road wing is held on by Trinity\* wing buttons and Bud's horizontal wing mounts. Using a spray can and brush-on polycarbonate paints, I created a *Car Action*-inspired paint scheme, and I drew the grid lines with a black permanent marker.

*(Continued on page 84)*



*The scratch-built air box effectively keeps dirt out of the 2-stroke's crankcase.*



*The O.S. CZ engine can be started quickly by an electric starter held tightly against the cone at the engine's rear.*



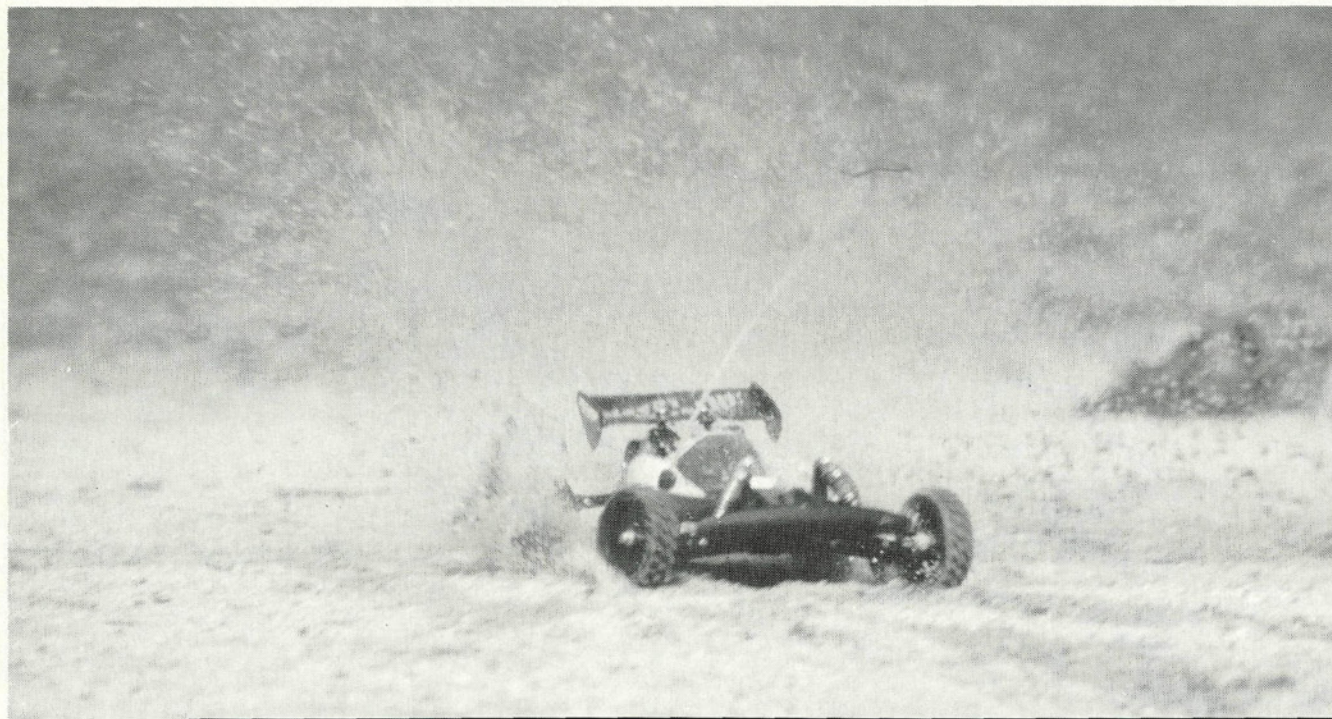




# DIRT DIGEST

by BILL O'BRIEN & BOB KANE

## AVENGING THE AVANTE



PHOTOS BY BILL O'BRIEN

*Tamiya's Madcap is fresh off the shelf, but "Bad Brain" has already come up with some hints to share with you.*

IF THE MONTHS went by any faster, I could probably keep track of them with the second hand on my watch (if I had a watch). If manufacturers came out with new cars any faster, I might not be able to keep track of them at all!

This is a "mostly Tamiya" month, with the Madcap and the Avante taking up most of my column. The Avante is probably one of the most underrated cars in America, if it isn't actually headed for the discontinued pile. That would be a shame. The very successful five-link rear suspension on the super-hot JR-X2 is very similar to the three-link rear on the Avante, and no one else has dared to come up with a linked-rod front

suspension like the Avante's! Oh well, there's no accounting for taste.

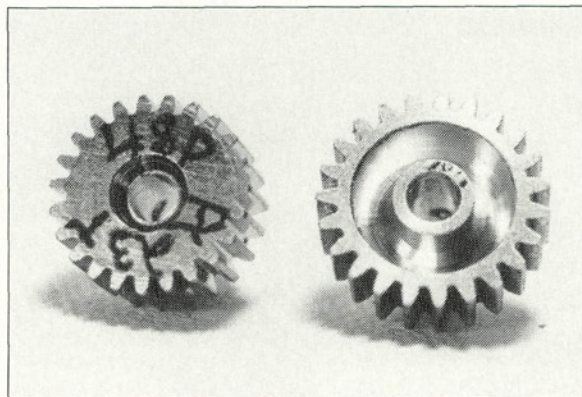
### AVANTE, SI O NO?

Despite its high-tech design, the Tamiya\* Avante is one of today's most maligned cars. Slippage and breakage seem to be its forte, but most of the problems are due to inexperienced car builders who had no

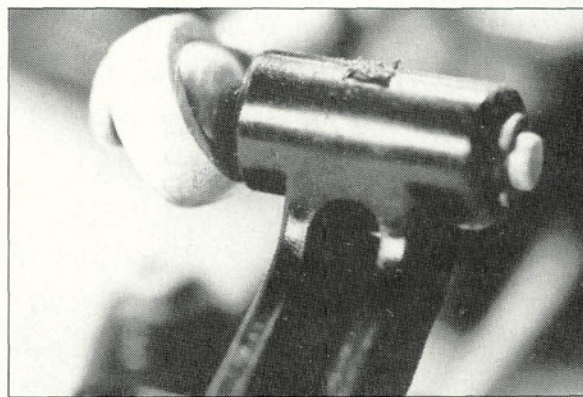
idea of the car's complexities when they bought it. There are a few simple things you can do to improve the car, and with Avante prices dropping like a brick, you might want to buy one.

The first and foremost trick is to do something with the shock absorbers. They work well; in fact, they work *too* well. During the compression stroke, they al-

*(Continued on page 92)*



*Side by side, the difference between the American 48-pitch gear (left) and the metric 48-pitch gear (right) are obvious. Both gears in the photo have 23 teeth.*



*At full extension, rod ends try to escape from their ball sockets. This will almost certainly knock you out of the competition.*



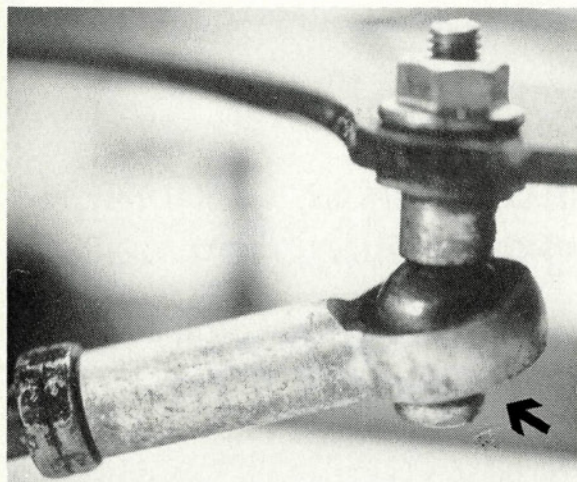
(Continued from page 88)

low the rear suspension to travel too far. If you want to find out how levers work, just pull off the shock and extend the rear suspension up as far as it will go. The stress points will be obvious, and, as everyone knows, it doesn't take much to bend and break aluminum. Sooner or later (sooner, as some Avante owners have discovered) the upper suspension rod will shear.

To prevent this, here's a trick I use on very low-tech cars and trucks that have poor suspension components: put about  $\frac{3}{8}$  inch of fuel tubing on the shock piston shafts to keep them from reaching their full compression limit. This solution is simple, effective and inexpensive.

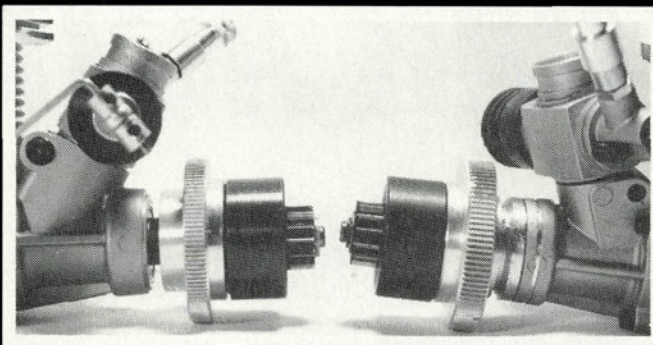
As for the slippage (again, a problem of misapplied leverage), Hirobo solved that problem years ago. Its Alien used very small pivot balls to hold the suspension rods. Their size allowed the rod ends to slip off under pressure, but Hirobo used a washer to cap the pivot ball after the rod was installed. When the rod end tried to slip off the ball, the washer held it in place. This system should work just as well on the Avante.

Those are the car's only real problems—honestly! They're what has given the Avante such a bad rep. People tend to get upset when they find small problems on a big-buck item. That's why I'd like manufacturers to run new vehicles in stock classes rather than in more exotic mains where the configuration of the car isn't the same as it is out of the box. I'd rather see an ad that reads, "We came in first in the Oshkosh Stock A-Main four times without breaking a part," than one that reads, "First in the 1990 IFMAR,"



A washer added to the screw end (arrowed) of any ball socket will prevent the rod end from snapping completely off the ball, while still providing free movement.

## OVERPOWERING BURNS



The flywheel for the O.S. .21 EX-R engine (left) is narrower and sits closer to the engine case than that on the O.S. .21 VR-B (right). The bottom line is that they aren't interchangeable.

I've long advocated a policy of "If it's not broken, don't fix it," but I can't seem to follow my own advice! My Kyosho Burns was doing perfectly well with an O.S. .21 VR-B engine, but the allure of the more powerful, brightly colored EX-B was overwhelming. I bought one for the Burns—it was its birthday, what could I do? I should have done nothing, absolutely nothing!

Trying to mount the EX-B was my second most frustrating experience of the last few years (divulging the most frustrating will have to wait for my track report on the BMT 891!). The motor mounts fit—and that's all. The flywheel didn't fit, nor did the pilot shaft (the support shaft for the needle bearings and the clutch bell). There was no way to transfer all that raw horsepower to the drive train. I sat there with the Burns in one hand, the megabuck engine in the other, and a thought balloon appeared over my head with a single word—"Huh?"

I don't know what you'd do in a similar situation, but despite the cost of the two items, I was tempted to test their

aerodynamic capabilities off the far wall! Instead, I gently set them down and calmly went to the Tower Hobbies catalogue. This catalogue is a necessity if you own a Kyosho product, and Tower has a very good list of available parts.

Under the Burns listing, just past the halfway point, I found the notation "BSW-22 Flywheel (OS 21-EX)." The pilot shaft was listed as FM-073, but I had a sneaking suspicion that this was the one I already had on the VR-B, and I was right. The correct pilot shaft was just becoming available, but Tower knew which one I wanted.

Everything fit well, and if my Burns tore up the dirt before, the extra spunk of the EX-B makes it suck up the ground in a vacuum as it goes by! I'm not even sure the tires always touch the ground!

where all too frequently the only similarity between the car that's run and the car you can buy is the name!

### GEAR-HEADED

When most people change to a motor with a more aggressive wind, they change the pinion gear to accommodate the added power. That's what I did on my Madcap, and it was a lesson in patience! I went to my local hobby store and bought the requisite assortment of Trinity 48-pitch gears to match the wonderfully new and different 48-pitch spur in the Madcap's marvelous ball diff.

My first clue that all was not well in "Gearland" came when I put the pinion and the spur together. The fit didn't look quite right. The second clue came when I tried to run the car. The gear train

screached like a cat with its tail in a meat grinder (that's an ugly thought)—as loud as anything I've ever heard!

Because undefinable gearbox noises are always a signal to stop what you're doing and double-check the setup, I did just that. I called Model Rectifier Corp., Tamiya's distributor. They confirmed that the spur gear was indeed 48-pitch, but they said it wasn't quite the same as the standard, run-of-the-mill 48-pitch gears I've come to know and love. "Normal" 48-pitch pinion gears wouldn't work, they said, but MRC sold the correct gears, and Robinson Racing Products\* also had pinions that would fit properly. I called Robinson to get the real skinny.

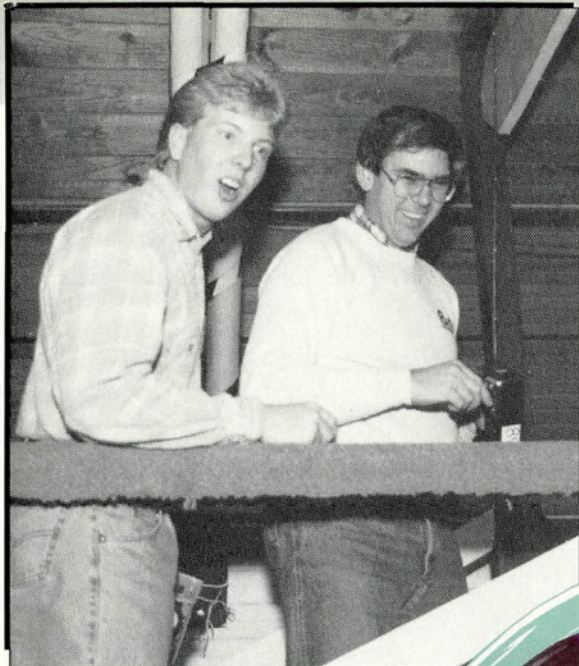
The Madcap uses a 48-pitch metric spur gear (as do the Astute and the King Cab, because they have the same gearbox). The word "metric" is the key to this whole conflict. Trinity's 48-pitch gear

(Continued on page 104)









Left: Chris Doseck (left) looks amazed after Bud Bartos' TQ run in Direct-Drive Modified.

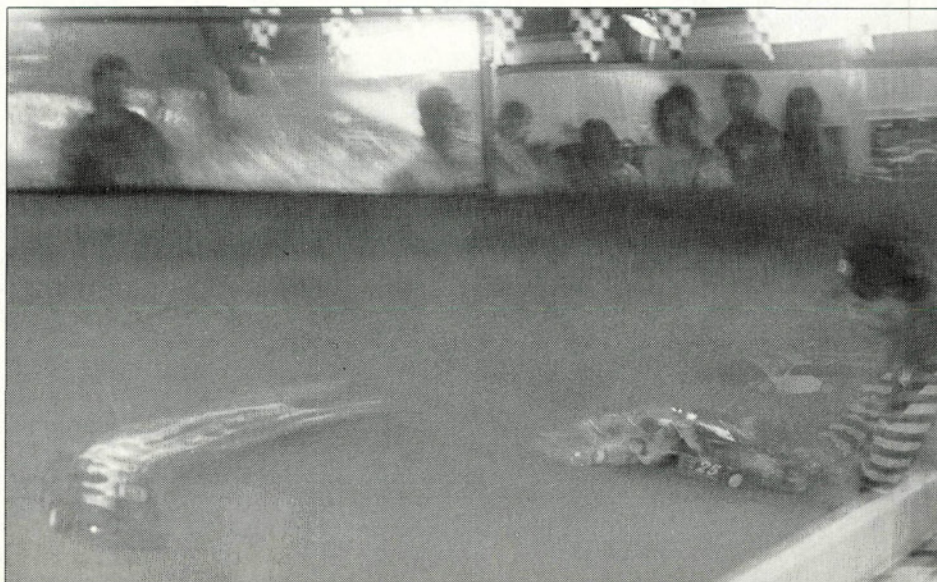
Below: Pat Dolan won 1st place in Concours with this sharp-looking Sunoco Oldsmobile.



PHOTOS BY WALLY DAVID

# K / N W I N T E R

***Big Guns  
Come to  
Town***







*This photo is indicative of the close, door-to-door racing that took place at the K/N Winterblast. With 190 racers on the first day, there was more room on the track than in the pits.*

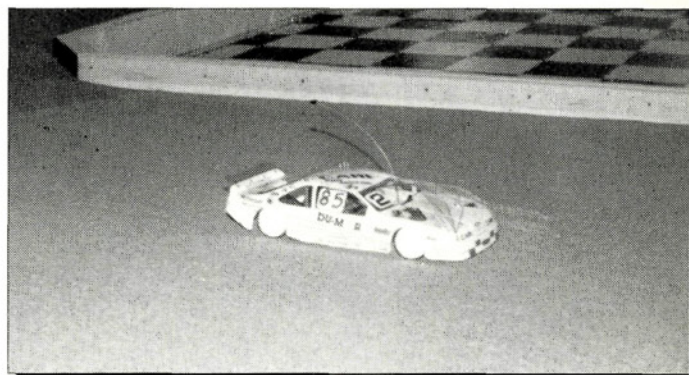
# BLAST

by WALLY DAVID

*Chris Doseck's Corally SP10 on its way to victory in Direct-Drive Modified.*

To challenge the carpeted banks of K/N RC Speedway in Stafford Springs, CT, some "big guns" did turn out, as did many hot regional drivers. On hand for the Winterblast were Bud Bartos of Bud's Racing Products, national  $1/12$ - and  $1/10$ -scale powerhouse Chris Doseck, *Car Action's* Senior Editor Rich Hemstreet, Dan Moynihan of Dan's RC Stuff, CAM Motors' Tate McDaniel (who provided the handout stock motors), and 1989  $1/12$ -Scale Stock ROAR Paved-Oval National Champion Mike Murphy. Had the race not been the

**M**ANY RACERS BELIEVE that they've been able to get the most out of their local track. They know the fastest line, the proper gearing, the perfect motor and the only tire combination that will work. They also know that the established track record won't be broken often, and if it is, it won't be by much. Then comes the day when the track owner decides to put on a big race to see if any of the "big guns" will show up. If they do, some exciting things can happen.



weekend before the Grand Rapids  $1/12$ -Scale Winter Championships, the turnout might have been even better.

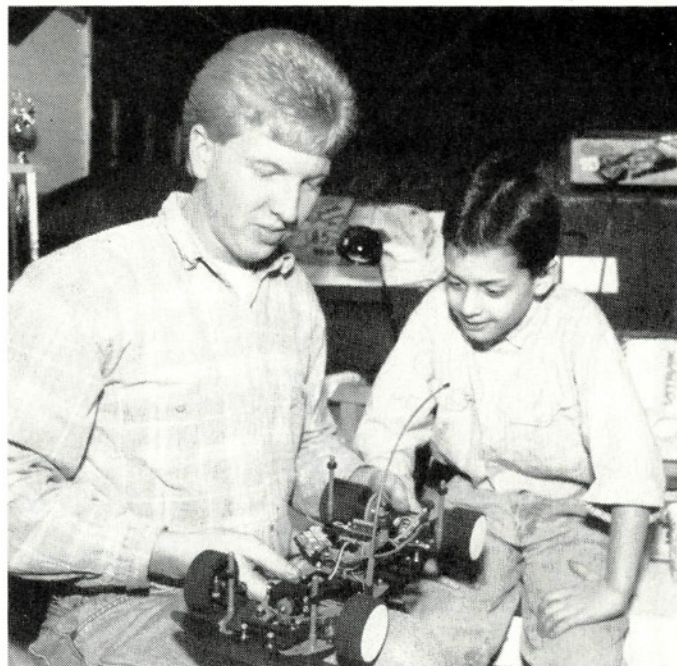
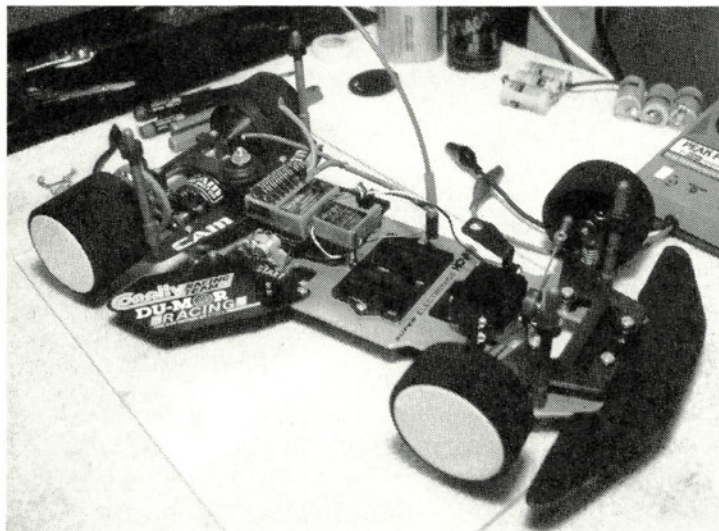
On Friday evening, there was an air of anticipation as practice got underway. Most of the racers and spectators had never been to a national-caliber R/C race, and they watched with awe as some incredibly hot laps were ripped off. Bright and early Saturday morning, everyone would see just how fast the track really was!



## LIVING UP TO ITS NAME

The race was named appropriately: racers were greeted Saturday morning with a true *winter blast*. Although a strong snowstorm made travelling to the track quite difficult, it did nothing to dampen the spirits of the racers as they lined up for their handout motors. For Saturday's stock racing, 196 cars were entered: 136 cars in the Direct-Drive Class and 60 in the Transmission Class.

There were some familiar faces in the Transmis-



Above: Chris "Little Dude" Doseck, and his new pal Anthony "Micro Dude" Colayevanni look over Doseck's Corally SP10, which won both Direct Drive classes.

Left: Doseck's Corally SP10 was so new that he'd never driven it before the Winterblast. When the car hit the track, it appeared as if he'd been driving it for years.

was second-fastest in Modified.) Piloting an RC10/Agitator, Pat Courchesne qualified fourth with 39 laps in 4:01.5.

In Direct-Drive Stock, some blistering times were set, and the qualifying action was very tight. Driving

### Direct-Drive Stock

FIN	QUAL	NAME	CHASSIS	MOTOR	ESC	BATTERIES	BODY
1	1	Chris Doseck	Corally SP10	H	Novak T1X	CAM	Bolink Thunderbird
2	4	Dan Cantalini	Associated 10L	C A	Novak T1X	Stage III	Parma Lumina
3	6	Mike Murphy	Lazer Lite	A N	Tekin 600	Murphy Cells	Bolink Lumina
4	3	Sean Tessier	Associated 10L	M D	Novak T1X	Periphex	Parma Grand Prix
5	5	Danny Flag	Flag Racing Prototype	O	Tekin 600	Stage III	Bolink LeBaron
6	2	Bill Little Jr.	Associated 10L	U	Novak T1X	Keil Pushed	Bolink Grand Prix

### Direct-Drive Modified

FIN	QUAL	NAME	CHASSIS	MOTOR	ESC	BATTERIES	BODY
1	2	Chris Doseck	Corally SP10	CAM 14T	Novak T1X	CAM	Bolink Thunderbird
2	4	Joe Scarbrough	Scratch-built	Trinity 14D	Tekin 300	Trinity	Parma Lumina
3	1	Bud Bartos	Associated 10L	CAM 14S	Novak T1X	Power Pushed	Associated Lumina
4	3	Mike Murphy	Lazer Lite	Litespeed 14T	Tekin 600	Murphy Cells	Bolink Lumina
5	6	Roger LaBreche	Scratch-built	CAM 14S	Novak T1	Trinity	Associated Lumina
6	5	Dave Wert	Associated 10L	CAM 14S	Novak T1X	Team Smooth	Bolink Thunderbird

sion Stock A-Main: familiar if you were at the 1989 New England Indoor Carpet Oval Championships (or read about it in *Car Action's* July '89 issue). Bruce Throne, last year's TQ and winner, again grabbed the TQ honors, with a 41/4:03.3, driving his basically stock JR-X2. Chris LeBlanc put his JR-X2/Agitator in the second spot, turning 40 laps in 4:03.1. Occupying the third position on the grid was Gary Yelin's scratch-built car, with a 40/4:05.1. (Last year, Gary

a brand-new Corally SP10, Chris Doseck took the TQ honors with a run of 47 laps in 4:04.1. (This was quite a feat for Chris: he'd just built the car the week before the race.) Sean Tessier and Bill Little Jr. both drove Associated 10Ls for 46 laps in 4:00.1 to qualify second and third, respectively. (Sean had a better back-up run.) Yet another 10L took the fourth spot: local favorite Dan Cantalini turned a 46/4:01.2. That's some pretty close racing!



# TIPS from ..... TRAVELING PROS

## CONCOURS, OF COURSE

Oval races always lend themselves to concours competition; the NASCAR stock car bodies used at most events can be painted to look like cars on the Winston Cup circuit. The Winterblast wasn't a disappointment. Pat Dolan won Concours with a stunning Sunoco body, detailed to replicate the Pontiac driven by Sterling Marlin. Steve Retteu won the Best Paint competition, with a Wisk-sponsored car. (Well, it's probably how the car *would* look if Wisk actually sponsored a Winston Cup stock car.)

## ON INTO THE NIGHT

It was Sunday morning by the time the Mains rolled around: the huge turnout made qualifying seem endless. The races were made up of six cars each, because it was felt that classes other than Transmission Stock would be too fast to handle more cars. As a result, with three heats as well as the Mains, everything took too long.

When the Transmission Stock A-Main started, TQ Bruce Throne led the charge into the first turn. Unfortunately, his JR-X2 had too much bite; it did a traction roll and was passed by the entire field. Scott Frazier took advantage of Throne's misfortune; he leapt from the fifth spot into the lead with his Flag Racing prototype car, followed by Chris LeBlanc's JR-X2/Agitator. Pat Courchesne's RC10/Agitator slipped by



*Jim Lescher (center) of Bullet Enterprises receives the Good Sportsmanship Trophy from track owner Nick Kahl (left) and Dan Moynihan.*

**G**OOD SPORTSMANSHIP is vital in R/C racing, and it's exemplified by the actions of Jim Lescher at the K/N Winterblast. From Shoemakersville, PA, Jim owns Bullet Enterprises (a supplier of matched batteries), and even though he was busy with his team drivers, he still found time to help everyone else. He answered questions about the care and charging of batteries, checked out racers' packs and lent batteries to racers who needed a little extra for their Mains. His activities didn't go unnoticed: Dan Moynihan, of Dan's RC Stuff, awarded him the trophy for Good Sportsmanship.

Helping seemed to be a major activity at the Winterblast: Bud Bartos, Chris Doseck, Tate McDaniel and Dan Moynihan didn't go to K/N RC Speedway to see how dominant they could be, or how many track records they could break: they came to spread good will and encourage people to keep racing.

In my January '90 article, "I Survived the Thunderdrome," I told you about the help I received from many top-name drivers, and I know many of you think they helped me because I'm with *Car Action*, but I bet every racer at the Winterblast will now appreciate just how friendly the atmosphere at R/C car events is. Bud and Tate continually helped racers dial-in their motors, Chris answered questions about car set-up and driving, and Dan encouraged everyone.

I'd like to see more top drivers and manufacturers attend some of these smaller "big" races. It really encourages enthusiasm for our hobby.

### TIRES (t/r)

..... Corally Green .....	Paragon Ground Effects
..... TRC Orange-Blue/Bolink Blue .....	Paragon Ground Effects
..... TRC Blue/Bolink Blue .....	Mura Tiger Milk
..... TRC Orange-Blue/Twinn-K Black .....	Racer's Choice TQ8
..... TRC (L-Orange,R-Green)/TRC Blue .....	Paragon Ground Effects
..... TRC Orange-Blue/Twinn-K Black .....	Racer's Choice TQ8

### TRACTION COMPOUND

### TIRES (t/r)

..... Corally Green .....	Paragon Ground Effects
..... TRC Blue/Twinn-K Black .....	Trinity Green Dot
..... Hyperbite Silver/Twinn-K Black .....	Paragon Ground Effects
..... Bolink (L-Blue,R-Orange)/Bolink Yellow .....	Mura Tiger Milk
..... Bolink Orange-Blue/Bolink Green .....	Paragon Ground Effects
..... Twinn-K Black .....	Paragon Ground Effects

### TRACTION COMPOUND

LeBlanc to take second, with Scott Sauro's JR-X2 in fourth. At the two-minute mark, the leaders tangled with back markers, and this allowed Sauro to move into the lead, followed by Courchesne and Frazier and LeBlanc. In the last 15 seconds, Sauro slowed a bit and Pat Courchesne was able to slip by him and take 1st with 41 laps in 4:05.1. Scott Sauro finished 2nd, with a 40/4:00.1, and Chris LeBlanc turned 40 laps in 4:00.5 for 3rd place.



With the Transmission A-Main out of the way, attention turned to the Direct-Drive Stock A-Main. At 3:17 a.m., the Main started, and surprisingly, very few people had called it quits. Chris Doseck's Corally SP10 took the point, with Dan Cantalini's Associated 10L in close pursuit, followed by the Mike Murphy's Lazer Lite.

The top three freight-trained around the track, never getting too far away from the others, as they all stayed on the same lap. Around the half-way point, Cantalini drew right up on the bumper of Doseck, applied tremendous amounts of pressure, and was able to slip by for the lead. After dropping back by about a quarter lap, Doseck seemed to have superior batteries when it counted; he came back up on Cantalini and rocketed by for 1st, turning 47 laps in 4:05.3. Cantalini held on for 2nd with a 46/4:00.4, and Murphy wound up in the 3rd spot, with a 46/4:01.8

The racing continued into the wee hours of the



## Transmission Stock

FIN	QUAL	NAME	CHASSIS	MOTOR	ESC	BATTERIES	BODY
1	4	Pat Courchesne	RC10/Agitator	H	Novak T4	Gonzo	McAllister Lumina
2	7	Scott Sauro	JR-X2	A	Novak T1X	Sanyo SCE	Bolink Lumina
3	2	Chris LeBlanc	JR-X2/Agitator	C N	Novak T1X	PTI	Associated Thunder
4	5	Scott Frazier	Flag Racing Prototype	A D	Novak T1	Stage III	Andy's Lumina
5	6	Danny Flag	RC10/Agitator	M O	Novak T1X	Stage III	Associated Lumina
6	1	Bruce Throne	JR-X2	U	Novak T4	Waits	McAllister Lumina
7	3	Gary Yelin	Scratch-built	T	Novak 1X	Peak Perf.	Associated Lumina

## Transmission Modified

FIN	QUAL	NAME	CHASSIS	MOTOR	ESC	BATTERIES	BODY
1	2	Scott Sauro	JR-X2	Twister 15D	Novak T1X	Sanyo SCE	Bolink Lumina
2	1	Scott Frazier	Flag Racing Prototype	Speedworks 15D	Novak T4	Stage III	Andy's Lumina
3	4	Steve Martin	Scratch	Cam Stock	Novak T4	Bullet Enterprises	Parma Grand Prix
4	6	John Jenson	RC10	Trinity 15D	Tekin 300	Twister	Andy's Grand Prix
5	5	Billy Wood	BRP RC-X2*	B&R 15D	Futaba 112B	Litespeed	Bolink Lumina
6	3	Scot Allen	J-Car/Track Master	Trinity 14D	Novak T1X	Leading Edge	MRP Thunderbird

\*This chassis uses an RC10 front end and a JR-X2 rear end.

morning, and it was encouraging for the drivers that nearly everyone stayed until the end. I was amazed at the number of people who were around for the trophy ceremony—which took place at 4 a.m.!

## THE MORNING AFTER

The turnout for modified racing was nearly half that for stock, but I don't think anyone minded. The late night took its toll on some, as did the continuing winter blast. Most people didn't get to sleep before 5:30, so it was astonishing that anyone was back when the doors opened at 8:00 a.m., but back they were. Track owners Karen and Nick Kahl and their brave staff never went home; they stayed to clean up the building, but they did manage to grab a few winks on the banks of the carpeted track.

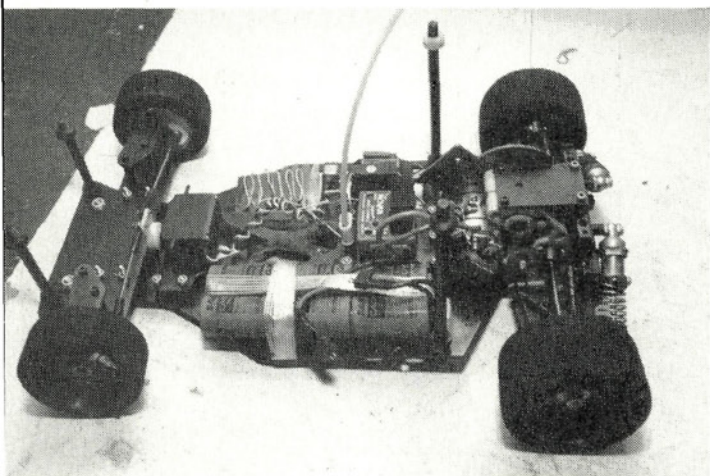
## GREAT SCOTT!

If you want to race Transmission Modified at K/N RC Speedway, you might want to change your name to Scott: the top three qualifiers in the Class were named Scott or Scot.

Scott Frazier's Speedworks/Flag Racing Prototype TQ'd with 43 laps in 4:00. Scott Sauro qualified second; his Twister-powered JR-X2 turned in a 43/4:02.7. Third in the Scott parade was Scot Allen who turned 40 laps in 4:01.5 with his Trinity-powered J-Car/Track Master. Fourth-fastest was Steve Martin (not the comedian). His scratch-built car, powered by the CAM stock handout motor from Saturday's racing, turned 40/4:02.5.

Bud Bartos obliterated the old Direct-Drive Modified track record of 49 laps: he took TQ honors



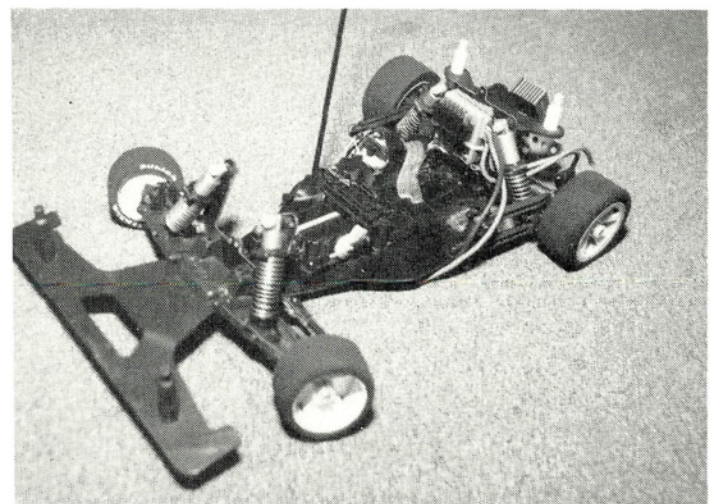


Left: Pat Courchesne grabbed the Transmission Stock title after starting from the fourth spot.

Above: Courchesne's RC10/Agitator conversion was the class of the field in the Transmission Stock A-Main.

IRES (f/r)	TRACTION COMPOUND
RC Orange-Blue/Delta Gold .....	None
olink Blue/TRC Green .....	Racer's Choice TQ8
RC Orange-Blue/TRC Blue .....	Racer's Choice TQ8
RC Orange-Blue/Bolink Blue .....	None
RC Orange-Blue/TRC Blue .....	Paragon Ground Effects
RC Orange-Blue/TRC Blue .....	Racer's Choice TQ8
RC Orange-Blue/TRC Yellow .....	None

IRES (f/r)	TRACTION COMPOUND
olink Blue/TRC Green .....	Racer's Choice TQ8
RC (L-Blue,R-Orange)/TRC Blue .....	None
RC Orange-Blue/TRC Yellow-Green .....	Racer's Choice TQ
RC Orange-Blue/TRC Yellow .....	Paragon Ground Effects
olink Blue/Bolink Green .....	Racer's Choice TQ8
RC Orange-Blue/TRC Yellow .....	Racer's Choice TQ



with 52 laps in 4:03.5 with a CAM-powered Associated 10L. Bud was followed closely by CAM teammate Chris Doseck, who had hoped to TQ in both classes with his Corally SP10; Chris had to settle for 51 laps in 4:00.3. Third-fastest was Mike Murphy's Litespeed/Lazer Lite with a 50/4:05.2, and Joe Scarbrough qualified fourth with the Trinity/scratch-built car with a 49/4:00.8

At the start of the Transmission Modified A-Main, Scott Sauro's Twister/JR-X2 took the lead, and he never looked back; he led Scott Frazier's Speedworks/Flag Racing Prototype and the Billy Wood's B&R/RC-X2 for most of the race. Toward the end, Wood slipped back and allowed Steve Martin's CAM/scratch-built car to move into third, followed by John Jenson's Trinity/RC10. When it was over, Sauro had turned 43 laps in 4:00.8 for 1st, Frazier was in 2nd with a 42/4:01, and Martin took 3rd with 39 laps in 4:01.

In Direct-Drive Modified, the stage was set for a real duel between TQ Bartos and second-qualifier Doseck, and Bartos came out on the losing end. Going into the first turn, Chris' CAM/Corally SP10 tapped Bud's CAM/Associated 10L, which sent Bud to the



Above: Scott Sauro won the Transmission Modified Class and also wound up 2nd in Transmission Stock.

Left: Sauro's JR-X2 was basically stock. It wasn't very exotic looking, but it sure was fast!

back of the pack. Mike Murphy's Litespeed-powered Lazer Lite and Dave Wert's CAM-powered 10L followed Chris, who eventually took 1st. Joe Scarbrough's Trinity/scratch-built car moved by Murphy and Wert on his way to 2nd place before Bar-

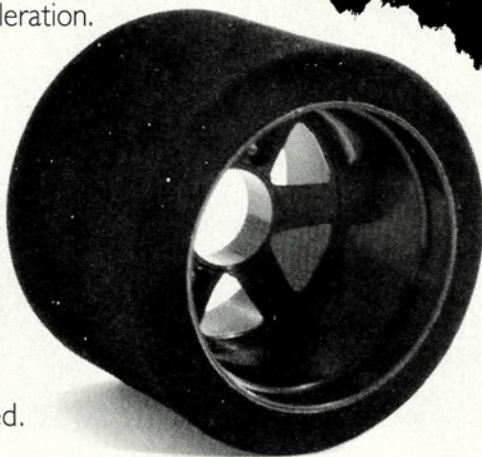
(Continued from page 124)



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## HIGH-OCTANE RC10

(Continued from page 84)

(and, occasionally, replace the pre-air filter) before I'm back out there.

After burning more than three gallons of glow fuel, I noticed a significant improvement in handling, high-speed stability and overall performance. Whether I'm accelerating through turns or down straightaways, the front tires are always firmly planted. The car has become a phenomenal jumper: it often lands on its wheels, no matter how bad the takeoff! It's competitive with super-stock 2WD cars, and it has *triple* the run time (15 to 20 minutes).

I plan to add an O.S. CZ-2 engine and a CZ-R carburetor (to retain the starting cone): this should supply the added power the model needs to go head-to-head with modified 2WD electric cars.

This car has been a blast, both to build and to run. If you're just entering the hobby, remember this: building, modifying and repairing your model is often as rewarding as running it!

\*Here are the addresses of the companies mentioned in this article:

**Kyosho/Great Planes**, P.O. Box 4021, Champaign, IL 61820.

**Associated Electrics**, 3585 Cadillac Ave., Costa Mesa, CA 92626.

**Tamiya/MRC**, 200 Carter Dr., Edison, NJ 08817.

**O.S./Great Planes**.

**Du-Bro Products**, 480 Bonner Rd., Wauconda, IL 60084.

**Team Losi**, 1655 East Mission Blvd., Pomona, CA 91766.

**Kimbrough Products**, 1420 East St. Andrews Place, Unit F, Santa Ana, CA 92705.

**Bud's Racing Products**, 52435 Route 113, Wakeman, OH 44889.

**Trinity Products**, 1901 E. Linden Ave., #8, Linden, NJ 07036.

## TROUBLESHOOTING

(Continued from page 37)

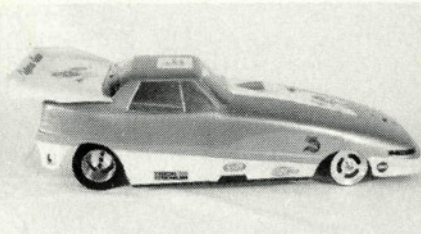


If your run time has been decreasing slowly, check the condition of your motor, but your charger could be the problem. It sounds as if you're using one with a 15-minute timer. In most cases, 15 min-

(Continued on page 104)



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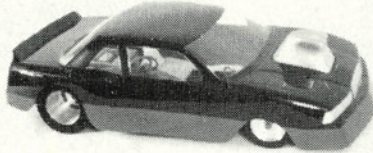
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A.J.'s UltraLite Aluminum Wheels For All Fine Design Kits	
Catalog	\$2.00

## TROUBLESHOOTING

(Continued from page 102)

utes isn't enough time to charge a 1200mAh battery: a completely dead one takes 20 to 25 minutes to charge to capacity.

*Check whether your battery is charged by seeing if it's warm (not after a run). When batteries near capacity, the internal resistance of the cells increases, and this generates heat. If, after 15 minutes of charging at 5 amps (the standard charge rate for this type of charger), the battery's temperature hasn't risen above room temperature, it's not completely charged. Give it another 5 minutes, while paying close attention to its temperature. (Don't leave it unattended.) When the pack is warm to the touch, it's completely charged and ready to run.*

## DIRT DIGEST

(Continued from page 92)

(and those from most American manufacturers) aren't based on metric standards: their 48-pitch notation refers to a gear with approximately 48 teeth per inch. The metric equivalent is somewhere between

(Continued on page 118)

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PHOTOS BY MIKE LEE

# KYOSHO TURBO RAIDER

IT'S SAID that nothing beats success. This is certainly true in R/C off-road racing, but success can be very short-lived, because someone is always out there plotting to knock your socks off with a better, faster car.

In the quest for the best entry-level off-roader, Kyosho\* took its successful Raider and simply

upped the ante. The Raider has already received *Car Action's* coveted "Car of the Year" Entry-Level Award—twice!—and it has now been upgraded with the most desirable hop-up parts. The result?—the Turbo Raider.

From its familiar plastic-tub chassis to its almost indestructible suspension arms, the Turbo version has retained the features of its well-mannered, easy-to-assemble predecessor. Added to the basic little beast are Kyosho Gold coil-over shocks, rad-colored rims, new block-style knobby rear tires, ball bearings and a hot Kyosho Mega Outlaw Stock motor. This extensive upgrade should satisfy many beginners.

Since the Raider's assembly was discussed in a May '88 *R/C Car Action* review, I won't bore you with a the blow-by-blow account of the guts and

The Raider becomes A t t

by MIKE LEE





gears. Instead, I'll discuss the pros and cons of the Turbo Raider; then I'll head to the test track.

Newcomers to the sport will be pleased with the kit's great set of instructions. The assembly is logical, and there are full-scale drawings of the screws and nuts to help you identify them—a big help for those of us who can't yet distinguish a 2.5mm screw from a 3mm screw.

## ASSEMBLY

First, you'll see the Kyosho Gold shocks, which are probably the best around. They come partially assembled, but you'll have to disassemble them to add more parts. You'll lose fewer parts this way, and they do look nice under the bubble

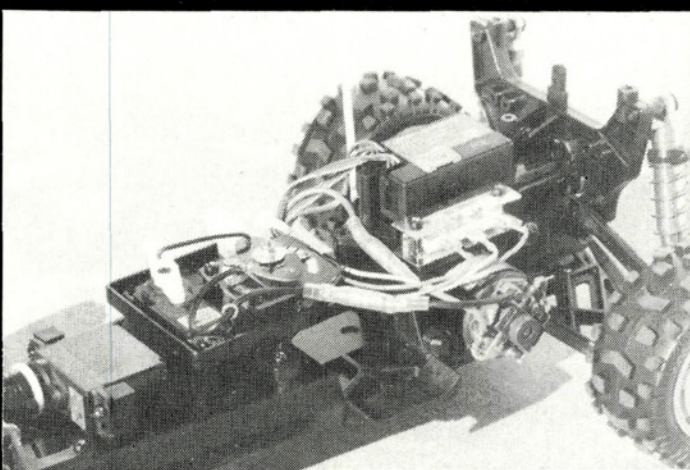
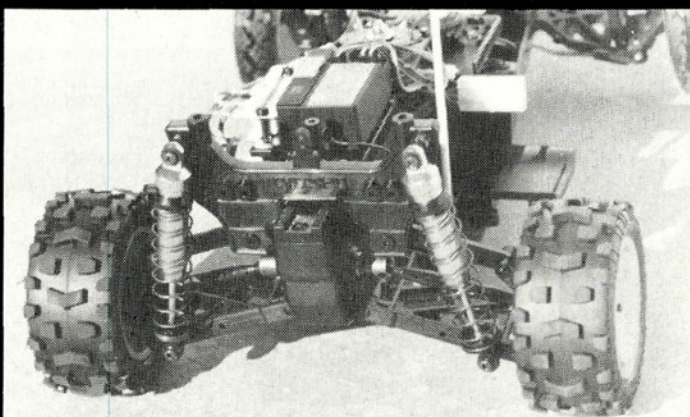
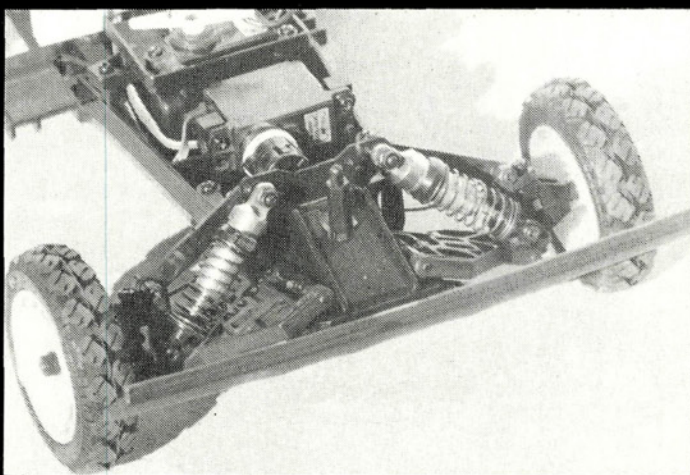
The front suspension uses the same suspension arms as the original Raider, and they're quite strong and flexible. (The flexing prevents the car from breaking on hard impacts.) Apart for the Gold shocks, there's nothing new here.

It was difficult to mount the motor. It's held to the transmission case by the standard, two machine screws, but between the motor and the tranny there's a metal plate. That isn't too bad, until you find the motor base plate, which mounts inside the tranny between the motor screws and the tranny case. "Snaking" the motor screws through the motor plate, motor, base plate and tranny case is a real pain. I've been racing for more

wrap, but this assembly method isn't really the best. Reassembling the shocks is no problem, however, and once they've been filled with oil, you'll have that famous dampening "squish" that means real suspension action. Coil-over springs round out the shocks, and adjusting collars are provided for the final adjustment.

than seven years, and this was one of the most difficult motor installations I've ever performed. Just wait until you try to change the motor *after* the tranny has been assembled!

Once the motor battle has been won, the rest of the tranny can be assembled. The two ball bearings that come with the kit are mounted at the car's



■ **Top:** The Turbo Raider's front end is well-thought-out. Necessary parts are kept to a minimum; this prevents the car from breaking and still provides good suspension action. ■ **Middle:** A pair of smoothly operating Kyosho Gold shocks hold up the rear. This design is very clean and simple. ■ **Bottom:** A look at the radio installation shows a neat, logical equipment layout. Note the dreaded spot-welder speed control. The Kyosho Mega Outlaw stock motor performed very well.



# TURBO RAIDER

most critical friction point: the main shafts at the rear axles. Everything else rides on steel compound bushings. Like bronze Oilites, these bushings must be oiled often, but they last longer than the Oilites. I applied liberal amounts of light grease to the gearbox, and the results were great.

Apart from the use of Gold shocks, no changes were made to the rear-end suspension, and the instructions will take you through this in no time. Again, I found steel bushings at the wheel shaft, but they can easily be replaced with 5x10mm ball bearings.

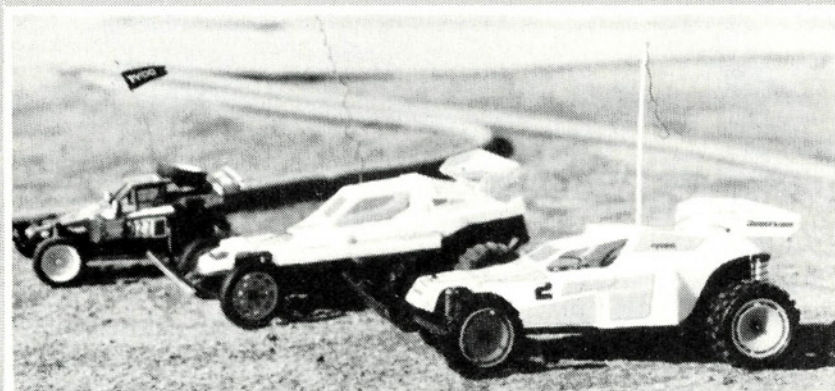
Installing the radio is almost a no-brainer affair, with standard-

size servos that slip right into place. In this case, I used JR Propo's\* Beat 2 Alpina radio—a good choice for beginners and experts. This wheel/pistol-grip-type radio uses a small, compact AM-type receiver and standard JR 606-type servos. The transmitter has throttle and steering end-point adjustments, servo-reversing, dual-rate steering and accessible trims.

My only real problem was with the mechanical speed controller. It didn't burn up (sometimes a problem with Kyosho speed controllers), but it did short out. I found a replacement, and it worked without a hitch.

Now for the wheels and tires:  
(Continued on page 127)

## I N T H E B E G I N N I N G



**E**NTRY-LEVEL off-roadsters began as converted road cars with huge tires, a buggy body and virtually no suspension. In the early '80s, a sophisticated car was the Tamiya Sand Scorchers with its oil-filled shocks, and an entry-level car was a Bolink Digger.

The demand for more advanced entry-level cars led to the production of the Kyosho Pegasus (also known as the Cox Bandito), the Tamiya Frog, the Grasshopper and a host of other simple cars. Most didn't have true shock dampeners; they had simple coil-over friction shocks, which allowed the cars to merrily bounce along the ground—quite a rough-and-tumble group.

Today, an entry-level car (such as the Turbo Raider) has oil-filled shock systems, ball bearings and adjustable suspensions. They're still a rough-and-tumble group, but, boy, have they come a long way! Here's the best part: they still cost about the same!

KYOSHO

### TURBO RAIDER

Type ..... Off-road  
Scale ..... 1/10  
Sug. Retail Price ..... \$149.95

#### DIMENSIONS:

Overall Length ..... 12 inches  
Width ..... 9.75 inches  
Height ..... 5.5 inches  
Wheelbase ..... 10.125 inches  
Track (f/r) ..... 8.25 inches

#### WEIGHT:

Gross (w/bat.) ..... 50 ounces

#### BODY:

Type ..... Off-road buggy  
Material ..... Polycarbonate

#### CHASSIS:

Type ..... Tub  
Material ..... Plastic

#### DRIVE TRAIN:

Primary ..... Pinion/spur  
Transmission ..... Gear drive  
Differential ..... Planetary gear diff  
Bearings/Bushings ..... Ball bearing for transmission/steel bushings for rest

#### SUSPENSION:

Type (f/r) ..... Lower A-arm, upper control link  
Dampening (f/r) ..... Gold, oil-filled, coil-over shocks

#### WHEELS:

Front: Type ..... One-piece plastic  
Dimensions (DxW) ..... 2x.75 inches  
Rear: Type ..... One-piece plastic  
Dimensions (DxW) ..... 1.75x1.5 inches

#### TIRES:

Front ..... Rubber pattern  
Rear ..... Rubber knobby

#### ELECTRICS:

Motor ..... Mega Outlaw Stock  
Battery ..... 7.2V, 1200mAh\*  
Speed Controller ..... Mechanical w/ 3-speed forward & reverse

#### OPTIONS AS TESTED:

JR Propo Beat 2 radio.

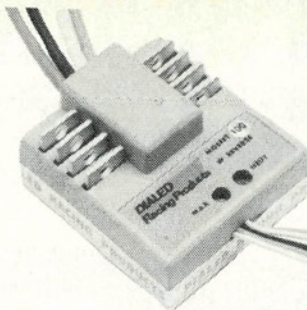
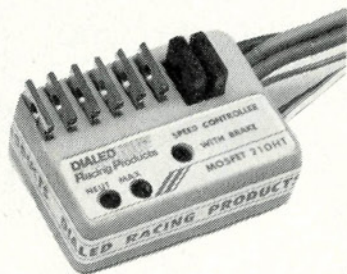
#### COMMENTS:

Kyosho has come through again! The upgraded shocks, ball bearings for the tranny and steel bushings for the rest of the car make the Turbo version even better than the Raider, which won Car of the Year twice. The only thing that should be replaced is the mechanical speed controller.

\* not included



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BEC	5.5V	YES	5.5V	YES	5.5V	5.5V
REVERSE VOLT PROTECTION	YES	NO	YES	NO	YES	NO
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## DIRT DIGEST

(Continued from page 104)

44- and 45-pitch, but neither is really correct.

The latest version of the Ultima suffers from the same ailment, because Kyosho also uses the metric system, as does most of the world (we're different, but I like it that way). If you're looking to do some pinion changes, don't rush down to your local hobby store, because odds are they haven't caught on yet and don't stock metric sizes.

You can order 48-m (for metric) pinions directly from Model Rectifier Corporation, or from Tower Hobbies\* under its Option House logo (be sure to specify metric). Robinson Racing Products has carried metric pinions for about two years (12- through 24-tooth), and they can supply you with replacement spur gears in stock 70- and 77-tooth configurations and at least one non-stock size.

## DOWN THE ROAD

In the last eight months, I've made so many modifications to my RC10 that I think the only things left from the origi-

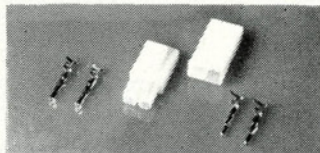
(Continued on page 122)

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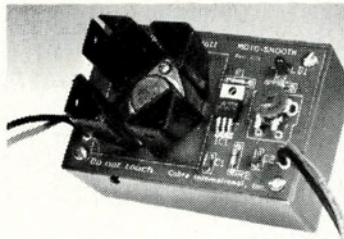
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## DIRT DIGEST

(Continued from page 118)

nal car are the rear bulkhead, spindles and spindle carriers! Now, there's something else: Track Master\* has released a direct-drive unit called the "Excaliber" that seems to work great on dirt ovals. Guess what I got? Guess what you're going to find out about next month?!

Don't worry—I haven't forgotten about the RS200. If you don't see it next month, you'll find it the month after. I'm also trying to get my hands on some Robinson Racing long arms for the JR-XT and Lunsford Racing's modified suspension links.

See you next month—same time, same R/C channel!

\*Here are the addresses of the companies mentioned in this article:

**MRC/Tamiya**, 200 Carter Dr., P.O. Box 267, Edison NJ 08818.

**Robinson Racing Products**, 165 N. Malena Dr., Orange, CA 92669.

**Tower Hobbies**, P.O. Box 4021, Champaign, IL 61820.

**Track Master Mfg.**, 1466 Pioneer Way, Suite 10, El Cajon, CA 92020.

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The 540S sport motor is fast and powerful, and Cat is ready to accept either 6 or 7-cell NICAD battery packs. In addition, Cat uses a hobby-standard, digitally proportional, two-channel radio system which can be removed and installed in other models in the future. The Cat is also the one entry-level car that is backed by immediate parts availability and a toll-free 800 line for technical assistance.

Cat has truly set the standard in its class. R/C Car Action thought so and named it "best ready-to-run off-road car" two years running!

Cat is available fully assembled and ready-to-run with a stick or pistol-grip radio system. Or, buy the kit and experience the satisfaction of putting it together yourself. The Cat is ready to go at your favorite hobby shop now.



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## K/N WINTERBLAST

(Continued from page 99)

tos also rocketed by both of them to take 3rd. That's the way it stayed for the rest of the race; no real ground was gained or lost, and all three finished with 51 laps.

When well-known racers come to a track, they usually raise the level of com-

petition a few notches. They push the local racers to new heights of racing prowess and make them search for ways to go faster. The evidence? In the Direct-Drive Modified Class, drivers well down into the B-Main broke or tied the old track record.

There will be no more "burning the midnight oil" in future races at K/N

Speedway; Karen and Nick will limit the number of drivers to 150 each day, and because the racers have demonstrated their great driving abilities, there will probably be eight cars in every heat. These changes should make things even better next time! ■

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## KYOSHO TURBO RAIDER

(Continued from page 116)


they're new and quite exciting. The bright orange/red plastic rims add a lot to the car's looks. The new, rear, block-design, knobby tires are killers, and they look as if they can handle loose to fairly damp stuff. The front tires are the same as those found on the original Raider.

Except for the decals, the Turbo Raider has the same body as the basic Raider. I sprayed the entire body white, and the decals created a surprisingly good-looking effect. After I had bolted on the wing (which, unfortunately, isn't adjustable), my car was complete, and it looked ready for the fight.

### PERFORMANCE

At the track, I was armed with several stick-style battery packs. I charged the batteries with the new Hobbico\* 910 AC/DC Variable Rate Charger—a heavy-duty charger that uses a standard mechanical timer to control the amount of charge packed into the cells. The amperage output can be adjusted with this unit, and it can also discharge and trickle-charge bat-

(Continued on page 136)



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

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# SCOPING OUT

by JOHN RIST

## KO PROPO CX-III— A HOT PERFORMER LOOKS COOL!

**A** SERIOUS SEARCH for speed will always involve the use of an electronic speed controller. Many of the serious race cars no longer come with a resistor-burning, power-wasting, mechanical speed controller. Why? Manufacturers seem to be realizing that this type of car is an all-out racing machine, and that an unwanted speed controller is a waste of money for budget-conscious modelers.

I'd also like to see radio manufacturers introduce another money saver: a 2-channel wheel radio that comes with one superfast, super-small servo, instead of the usual two average servos. I'd apply the money I saved toward buying a *super-hot* speed controller like the KO Propo\* CX-III.

### THE "SCOPING OUT" LAB

John Rist's lab consists of:

- an oscilloscope
- a digital voltmeter
- a resistor load bank
- a 6V 30-amp electricity supply
- a Pit Stop Radio servo/speed controller tester.

The oscilloscope is used to monitor the controller's output and to guarantee that it's fully on.

The digital voltmeter takes all the voltage-drop readings and verifies the reading on the current meter.

The resistor load bank consists of 40, 12-ohm, 5-watt power resistors, which can be switched on and off one at a time to vary the load between .6 amps and 20 amps.

In series with the resistors is a 25-amp Simpson current meter and a 1-percent .01-ohm resistor. By measuring the voltage drop across this resistor, the current-meter's reading can be double-checked. Of course, the lab power supply provides the test current.



PHOTOS BY JOHN RIST

*With very low voltage loss and excellent current-handling capabilities, the KO CX-III ranks highly for the serious racer. The Pulse Checker that's included in the kit determines whether the maximum throttle setting is adjusted correctly.*

The KO Propo CX-III is the hottest-looking speed controller I've seen. Its gleaming black-and-chrome case (on top of which is a massive heat sink) has the look of a custom chrome air filter sitting on top of a supercharger. "Supercharger" would be a good nickname for this speed controller because it has *hot* numbers in the spec department. The CX-III is a forward-only with brake (no reverse), racing-style controller with these features:

- 10 FETs for forward
- two FETs for brakes
- all-metal case
- built-in heat sink
- built-in on/off switch
- separate pulse-checker with two LEDs, and color-coded leads with alligator clips for easy attachment
- KO Propo receiver connector and Kyosho battery connector

When assessing a speed controller, I first look at the quality of its components and how carefully they've been assembled. When I disassembled the KO Propo CX-III, I had a few surprises, the first being the number of FETs in the unit. It has 12—10 forward and two braking. This leads me to suspect that this controller should be a major-league performer. My next surprise was that the case was made entirely of aluminum, but this explained its hot, glossy, black-and-brilliant-

chrome finish.

The inside looks fair. The solder was quite heavy around the FET output leads, and this helps to lower the unit's resistance. I found solder flux residue, which looks bad but doesn't hurt anything, but I also found wire clippings left over from trimming the parts' leads. They were all stuck in place but if one of them had come loose during a hard bump (we all crash, you know), it might have caused a problem.

The parts placement is fairly tight, but KO Propo could have squeezed in the pulse checker. I prefer a built-in pulse checker because it works with the motor wires connected and doesn't get lost in my toolbox. Finally, I noted that the FETs have insulated heat tabs. This type of FET doesn't usually dissipate heat as well as the metal-tab type, but it does have the advantage of being "short-proof." The heat sink fit very tightly, and this should give it good contact with the FETs and allow cool operation.

This speed controller is a true racing type, as shown by the absence of motor connectors, which allows you to install high-grade connectors, or to wire the motor direct. As with all racing-style speed controllers, I run two voltage-loss tests, one from connector to connector and one at the 2-inch point on the wires. While



We think many of our readers have ideas that are worth sharing. How many times have you read an article and said, "I could do that!" or "That's not the only way to do that; my way is easier!" Could be!

**Here's your chance.** We're expanding *Radio Control Car Action* and are looking for additional contributors to help us accomplish this objective. Of key importance are good photographs; the writing we can help you with. Interested? It's much easier than you might think!

Let's hear from you. Send in your article ideas and a few sample photographs. We're looking forward to seeing them.

Rich Hemstreet  
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### KO PROPO

#### CX-III

##### DIMENSIONS:

Height (with heat sink)	1 inch
Width	1.61 inches
Length	1.75 inches
Weight (without wires)	2.1 ounces

##### TUNING:

Access to Controls	Excellent
Ease of Adjustment	Fair*

##### PRICE:

Suggested Retail	\$249.95
Warranty	90 days

##### ELECTRICAL:

(Manufacturer's Specs)

Max Voltage	8.4 volts
Min Voltage	6 volts
Max Current	2100 amps†
Continuous Current	510 amps†
Resistance	.002 ohm†

##### TEST PARAMETERS:

Voltage	6 volts
Current	12 amps
Voltage Drop, w/connectors	0.18 volt
Voltage Drop, 2-inch wire point	0.05 volt
Calculated Resistance:	†
Resistance w/connectors	0.015 ohm
Resistance, 2-inch wire point	0.004 ohm
BEC Output, 6-cell battery	5.96 volts

##### NOTES

\* Controls not marked on face of speed controller.

† These specs are for the FETs only.

‡ Resistance = Voltage Drop/Current

##### COMMENTS:

A hot-looking speed controller with hot specs, the KO Propo CX-III has earned the nickname "supercharger"! The instruction sheet is very poor and the pulse checker is a separate unit, but the CX-III's performance overshadows its shortcomings. The KO Propo CX-III is a cool-running, high-performance speed controller. Its measured "on-resistance" of .004 ohm puts it in the serious racing class!

passing a hefty 12 amps, I measured a 0.18 voltage drop from the battery connector to the end of the motor wires. This calculates out as .015 ohm. I then re-ran the test with the same 12 amps flowing, but at the 2-inch point on the wires, the voltage drop was a mere .05 volt—an incredible .004 ohm. This seems to verify KO Propo's FET-only specification of .002 ohm. These readings definitely put the KO Propo CX-III in the serious racing class.

My final lab tests are designed to see if the controller can take the abuse it will have to endure in the racing world.

• The "let-it-cook" test. I adjust the current to the limits of my resistor load bank—18 amps. I then let the controller cook at full throttle for 15 minutes without any cooling (no fan allowed for this test!). After 15 minutes, the controller was still cool, and I wondered if the power supply had failed, but when I touched the load resistor bank, it was very hot. The FETs in this speed controller are of such a low resistance that they dissipate very little power and stay cool despite the poor thermal path caused by the insulated tabs.

• The "dead-short" test. For this, I've soldered two alligator clips onto both ends of a length of monster wire. I clip this contraption across the resistor load bank to simulate the current drawn by a jammed gear or a burnt-out motor. During this test, the alligator clips became so hot that I found it difficult to grab one so that I could disconnect the short. After being subjected to the short for 1 minute, the KO Propo CX-III was only just warm. Its built-in heat sink works well. With test results this good, I was ready to install the KO Propo CX-III in my trusty Turbo Ultima.

### SOMETHING'S MISSING!

Now to this speed controller's *real* defect—the instruction sheet, or I should say the *lack* of an instruction sheet? The sheet does have a clear picture identifying all the connectors and controls, and this is fortunate, because there are no



## SCOPING OUT

markings on the controller to tell you which of the three pots adjusts what.

Now we come to the CX-III's other defects—its connectors. It has the battery connector that's standard on most speed controllers. This isn't necessarily bad, but printed right on the seal of the controller's box, there's a warning that the warranty is void if you change any of the connectors. (This warning is repeated on the bottom of the speed controller.) As shown by the large difference between the connector-to-connector and the 2-inch wire test, most of the losses in an expensive speed controller occur in the very poor stock connectors.

Another question concerns the availability of different types of receiver connectors. The unit I tested came with a KO Propo-style receiver connector. If this is the only type available, it leaves us Futaba owners out in the cold. (*Editor's note: Adapters are available for Futaba*

learned that this is the power-supply wire for KO Propo's high-powered steering servo. The pin connector has a piece of insulation covering its sides, but not the very end.

As luck would have it, the wire flopped around and the end touched the negative battery lead. A spark flew and the controller was dead. A quick check with a voltmeter revealed that the BEC circuit was putting out zero volts. A tear-down showed that a piece of ground etch was missing from the board. Repairing etch isn't a job for the average modeler. A successful repair requires a microscope, a grounded-tip soldering iron, a small pair of tweezers, and very good soldering skills. (Besides, most manufacturers of speed controllers offer a reasonably priced repair service.)

I have the right tools, so I was able to repair the burnt etch and restore the KO Propo CX-III to its original condition. If

just the acceleration characteristics freely." I adjusted this control through its full range of settings, and it had very little effect on the CX-III's performance. At best, when set to its "soft" mode, it might reduce some of the motor noise and subdue glitching.

After running several 6- and 7-cell battery packs, it was obvious that this is a hot speed controller. Run times were excellent; acceleration out of the corners was good; and the brakes were strong enough to produce wheel-sliding spin-outs. Throttle response was very smooth all the way from slow to pedal-to-the-metal. Through all this, the heat sink stayed cool, and this shows that the KO Propo CX-III efficiently delivers all the battery power to the motor.

This controller is a thoroughbred that will be at home on the race course. It's bigger and about 1 ounce heavier than some of the 7-FET speed controllers on the market, but I think the improvement in performance produced by having 10 FETs in parallel is worth the increase in weight. If you want a lighter car, use less paint or a lighter chassis. The absence of a decent set of instructions, the inability to change the connectors without voiding the warranty, and the use of a separate pulse-checker are this controller's major faults.

I prefer a built-in pulse checker for two reasons: first, it's a pain to disconnect a direct-wired motor every time you want to check the controller's settings. Second, my toolbox *eats* pulse checkers. I never can find one when I need it.

In defense of KO Propo's pulse-checker, I'll say it was very precise: its results and my oscilloscope readings were identical. On the connector-versus-the-warranty issue, I run the controller with its original connectors until I'm sure it's in good working order, and then I hack off the connectors and replace them with racing-quality connectors like Sermos\* silver-plated Powerpole connectors.

I think the KO Propo CX-III is a winner, and now that I have this new weapon in my arsenal, I'm looking forward to the first race of the summer!

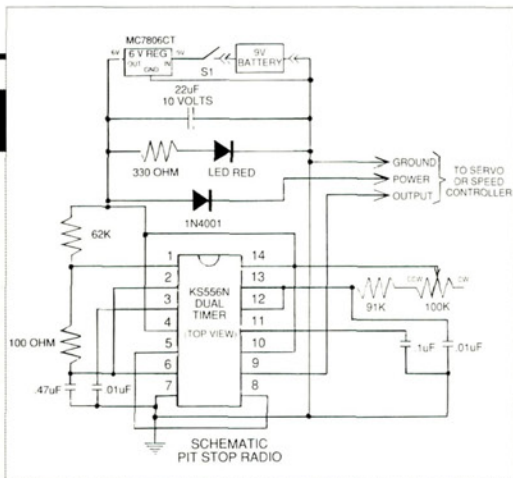
*\*Here are the addresses of the companies mentioned in this article:*

**KO Propo**; distributed by Global Hobbies, 10725 Ellis Ave., Fountain Valley, CA 92728.  
**Sermos R/C Snap Connectors**, Cedar Corners Stn., P.O. Box 16787, Stamford, CT 06905. ■

## BUILDING BLUNDER

I must respond to a number of letters I've received about the "Build Your Own Pit Stop Radio" article in the March '90 issue. It seems I made a mistake in Figure 1. Pins 8 and 9 of the KS556N IC are swapped. Pin 9 should go to the output, and Pin 8 should go to Pin 5.

There's also some confusion about the value of two capacitors in the parts list. The 47mfd 50V should be .47mfd 50V, and the 01mfd 50V should be .01mfd 50V—note the *decimal point*. With these corrections, you shouldn't have any problems. The printed-circuit board is correct and the Pit Stop Radio *will* work.



and Airtronics connectors.) To further cloud the connector-replacement issue, in their instruction sheet, KO Propo states, "Ni-Cd battery connector (if it does not match the battery connector, use the separately available racing connector)." Despite the absence of an installation diagram, I managed to install the controller in my car.

Also ignored by the instruction sheet: a small blue wire (with a pin-style connector on its end) that was sticking out of the side of the controller. During a phone call to my boss back at *Car Action*, I

you don't use this small blue wire, tape its end or remove it to avoid accidental shorts.

## PERFORMANCE

I finally made it to the race track to try out the KO Propo CX-III under racing conditions. With instruction sheet in hand (the adjustment pots aren't marked on the controller), I set the neutral- and high-speed settings to match my transmitter. There's a third trim pot that's identified in the instructions as a "Curve Control Adjustment." Supposedly, you can "ad-



# CLOD

## TOUR DE FORCE!

### PULLING *Modifications*



by JAMIE KRINSKI  
& EDDIE WOHLERS

**S**INCE THE FIRST pair of oversize tires were bolted to a 4WD, both 1/10-scale and full-scale truck enthusiasts around the nation have continued to push the performance of their trucks past almost every conceivable limit. Just as the world of full-scale monster trucks has evolved into car crushers, mud bidders, and now the new breed of "racing" trucks, R/C trucks have followed in the same steps. Only now are they beginning to test the waters of sled pulling, and rest assured, the best is yet to come!

While this project may not be the definitive word in sled pulling, the combination of the accessories gave this truck devastating pulling power—thus the title, Rising Force.

What is Rising Force? It's a stock Tamiya\* Clod Buster with some serious modifications. For a more custom look, I used a







Parma\* Lexan Clod Buster replacement body instead of the injection-molded polystyrene body. (It's also much easier to finish, because Lexan bodies are painted from the inside, whereas plastic bodies are painted from the outside). The hardest part of

finishing the body was painting the hot flames. After painting the body black, the flames were masked, drawn, cut with an X-Acto and air-brushed. A candy-apple yellow was applied to the windows to obtain the amber tint effect. To add the real custom touch, I looked to Smokin' Hobbies\* in Pearl River, NY, for an aluminum bed cover, tubular motor guards, front and rear smoke stacks that really smoke, and a few other accessories. Adding these accessories to the truck was the easy part.

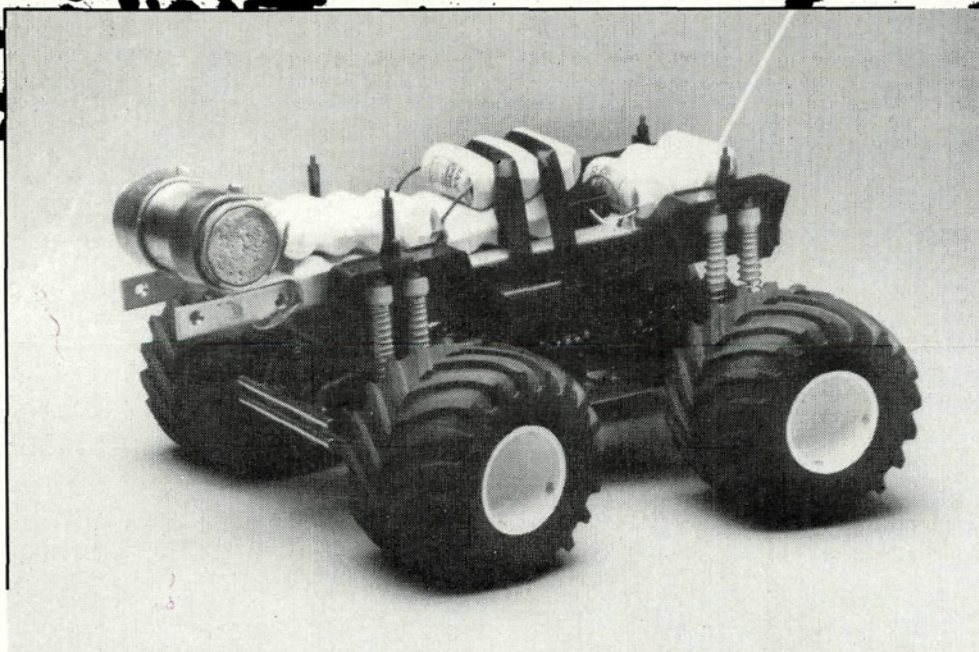
The critical link for a successful pull is a pair of healthy powerplants. Thanks to Car Action and Trinity Motors\*, I was able to use a pair of early production motors that are being developed by Trinity. These motors have a tremendous amount of torque, which is ideal for sled pulling. Appropriately named Matched Madness, the pair of motors includes one standard-rotation motor and one reverse-rotation motor, which is necessary when running the Clod Buster without the power/economy switch. Both motors feature precision ball bearings, all-aluminum heat-sink end bells, heavy brush springs and brush heat sinks.

I needed some heavy voltage to power this monster, so Eddie from Head

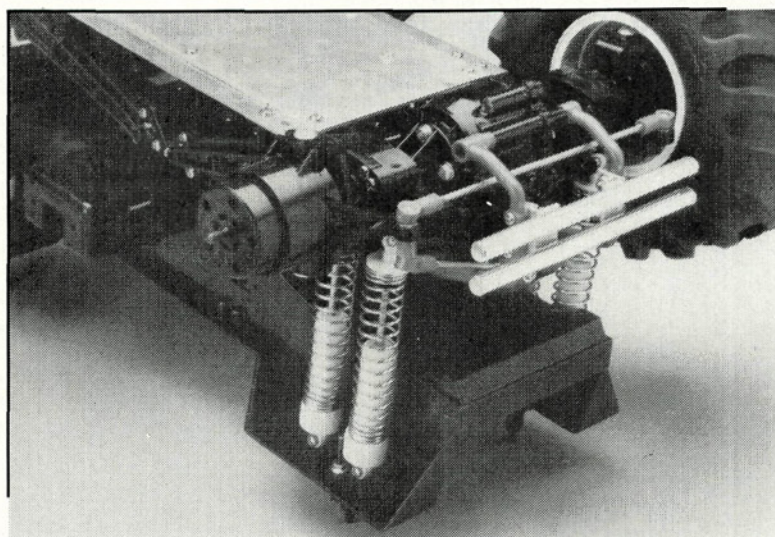


PHOTOS BY STEVE POND

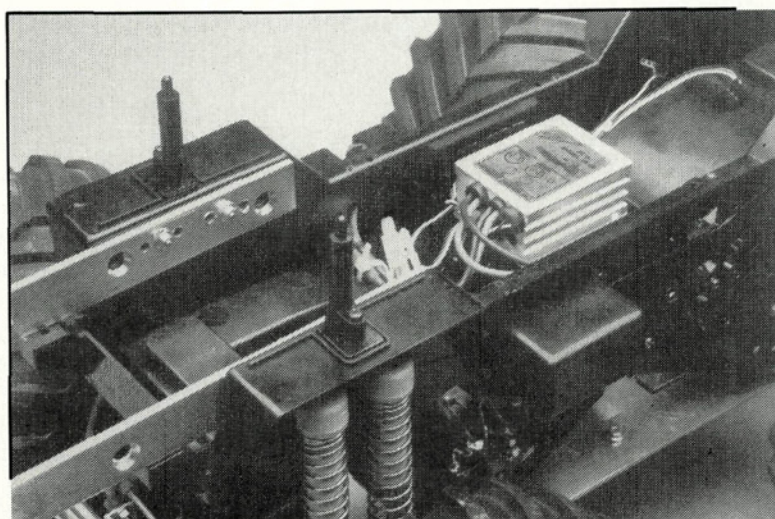




*Ready-to-run sans body, you can see how much room those 20 D-cells take up!*



*A look at the bottom of the Clod shows the brace that's used to stiffen the chassis. The shocks soak up whatever movement remains for maximum traction.*



*Buried in the bottom of the chassis, underneath the custom battery plate, is the Hydro Zeta speed controller.*

Tech Inc. custom-welded 20 (count 'em, 20!) 4000mAh Sanyo\* D-cells together to give us 24 pure volts of juice. Delivering all this voltage to the motors without an instant meltdown would take a serious speed controller, so I took PDI\* up on its claim that the Hydro Zeta could handle dual Cobalt Motors with 24 volts without blowing up. It worked fine except for minor glitches

where the throttle stuttered, which were probably caused by pumping so much voltage into the motor, which causes the brushes to arc. To keep a constant supply of voltage going to the receiver, I used a separate receiver battery pack and an on/off switch instead of BEC (who's worried about weight?). For a radio, you might think that an elaborate system (e.g., the PCM or the new Magnum) would be required, but if you think about it, the most range you will ever need with a puller is about 60 feet. I wound up using my old, reliable Futaba\* Magnum Sport, and it worked like a charm.

Since this truck is designed exclusively for pulling, proper gearing is necessary for pulling heavy loads. I used the stock transmission, but what really did the trick was the new Stormer Racing\* 4:1 gear-reduction boxes for the Clod Buster. These gearboxes are precision machined and anodized gray, which makes them look as good as they work. The gearboxes come with a 13-tooth pinion and a 52-tooth spur gear to obtain the 4:1 ratio, but they're designed to accept most of the popular 32-pitch gears, so any number of ratios are available.

After assembling this power puller, I came across some obstacles, the first of which was to overcome the twisting of the chassis under the extreme torque. I replaced the four lower retaining arms with a custom chassis-brace plate, which was made from sheet aluminum and end strips of thicker brass. When this was done, I found that the transmission was no longer stationary, so out came the brass strips again, and, after some bending and screwing and drilling, I created a pair of tranny braces. With the tremendous loads on the chassis, it was also necessary to lock up the rear steering to prevent the truck from wandering off the track, so I

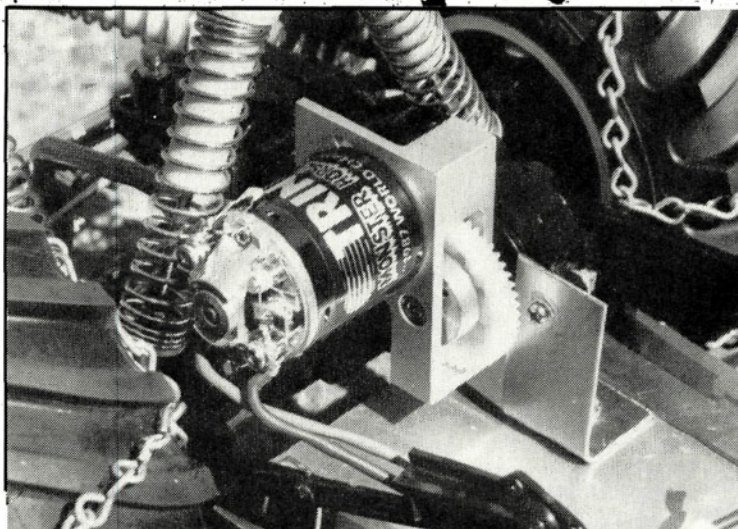


mounted the upper control rod to the steering servo-saver mount with a rod and bolt, and then disconnected the rear steering rod from the servo. This eliminated the twisting of the chassis parts and helped the truck stay straight on the track. To firm up the ride and help carry the 7½ pounds of batteries, I used Tamiya long oil-filled shocks instead of the stock shocks.

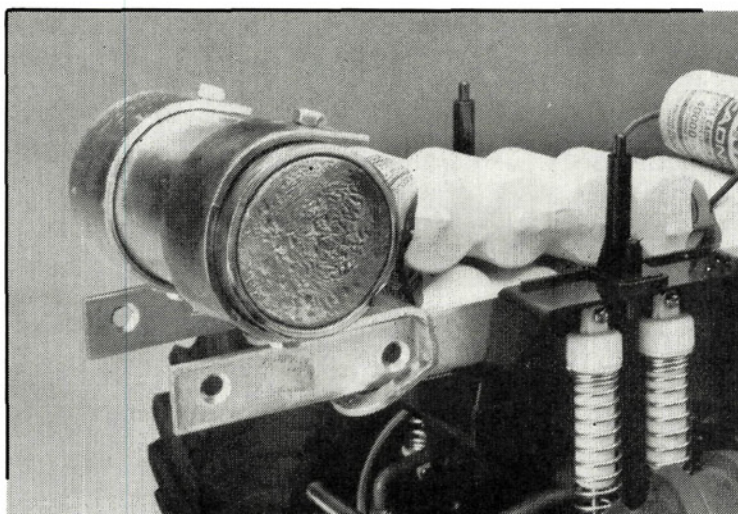
With all this extra weight on the truck to help it pull, the stock tires will collapse if they don't get some help. I filled the tires with foam and glued them to the stock rims. For a little extra insurance, the tires were also screwed to the rims, but I still needed more traction in the dirt. This is when Paul and Timmy Abbot of the Abbot Chain Company took control and manufactured the best set of traction chains I've ever seen on a monster truck! Paul also made the 7-pound front bumper weight to keep the front end down while pulling.

With all the hardware attached to the Clod Buster, we loaded up the A.J.'s\* Challenger pulling sled with some weights that I had taken along, figuring it would be enough to stop the Clod in the dirt. With a total of three 15-pound weights and about 10 pounds of lead in the bottom of the tray, we hooked up the Rising Force for the inaugural pull. Much to our surprise, the Clod was able to take the 55 pounds to a full pull, and then it continued to drag the sled even with the rear wheels locked up! Since we started with all the weight we brought, we had to search for a couple of hefty boulders that we thought would have no problem stopping the Clod. Surprise—not a chance! After dragging the boulders home and weighing them, we found that they weighed a total of 185 pounds! In both cases, the Clod began to break a sweat, but it was still able to cross the 30-foot mark both times. With our boulder supply exhausted, we had to find a way to get more weight on the sled. After a search, we wound up putting Timmy Abbot on the sled, and *still* the Rising Force was able to beat the sled! With no other alternative, we finally found something that we were sure would stop the Rising Force: a Jeep. Not a 1/10-scale Willys—a *real* Jeep. Just for kicks, we tied the Rising Force to Steve Pond's CJ-7 to see if it could move it, and—wouldn't you know—it did! While it was only able to move it about 2 feet before the rear differential exploded, it blew my mind that this Clod actually moved a Jeep!

I've taken the Rising Force back to the workshop for repairs, and although there's still room for improvement, I'm confident this configuration, with a few changes, will be a tough truck to beat. For future runs, I'll either use fewer cells or split the 20 cells between two speed control-



*With the use of the Stormer Racing 4-to-1 gearbox, the overall drive ratio in the Clod Buster is 132 to 1! When coupled with Trinity's new Matched Madness pulling motors, it makes for an awesome pulling set-up.*



*To keep the front end on the ground during a pull, this 7.5-pound weight was attached to the nose of the Clod.*

lers. The 20 cells made for a nice show, but it's too much voltage for these motors if you want them to last. If you run a single speed controller, I don't recommend that you use more than 14 cells. This will provide plenty of voltage to get the truck moving with much less strain on the motor. It seems that the only weak link in the Clod after these modifications was the stock differential, which is the only limiting factor when pulling. The motors, 4:1 gearboxes, speed controller and the rest of the chassis were up to the task. Until someone comes up with some replacement gears, I'll have to get used to replacing the stock gears!

Thanks to everybody who made this truck and article possible and, remember, may the force be with you!

*\*Here are the addresses of the companies mentioned in this article:*  
**Tamiya/MRC**, 200 Carter Dr., Edison, NJ 08817.  
**Parma International**, 13927 Progress Pkwy., North Royalton, OH 44133.  
**Smokin' Hobbies**, 9 North Main St., Pearl River, NY 10965.  
**Trinity Products**, 1901 E. Linden Ave., Linden, NJ 07036.  
**Sanyo Electric**, Battery Division, 200 Riser Rd., Little Ferry, NJ 07643.  
**Product Design, Inc.**, 16922 NE 124th St., Redmond, WA 98052.  
**Futaba**, 4 Studebaker, Irvine, CA 92718.  
**Stormer Racing**, 23 High Speed Rd., Glasgow, MT 59230.  
**A.J.'s R/C**, 2102 Guilderland Ave., Schenectady, NY 12306. ■



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## KYOSHO TURBO RAIDER

(Continued from page 127)

teries. With the AC/DC feature, it can be used anywhere. I found the 910 to be one of the first constant-rate chargers that actually holds the amperage all the way through the charge cycle. (Most taper off significantly.) Overall, this is a very good charger.

Once the batteries were charged and ready, I put the Turbo Raider on the oval portion of the track. Although it handled the oval well, its tail swayed noticeably, and this was unexpected, since the motor is mounted midships. After checking the suspension, I decided to loosen things up in the rear for more bite, but this didn't do the trick. I attributed the tail sway to the block-style rear tires, which perhaps weren't the greatest for a dry dirt-track oval.

On the off-road course, the Turbo Raider is a lot of fun. It nosed over the jumps a few times, so I tightened the front springs on the shocks. That cured the problem on the jumps, and I still had good front-end bite, but the tail continued to sway on the turns, even when the track had been dampened. Tires with more bite are needed to stick the back end to the track.

With the equipment supplied in the kit, the Turbo Raider will be another hit with freshmen drivers. Assembly is fairly easy, the instructions are great, and it's one of the most easily maintained off-road cars you can buy.

The upgrades are well worth the effort, because they do improve the car. The only item worth replacing is the speed controller. If I were a betting man, I'd say that the odds that you'll see the Turbo Raider at your local track are very good.

*\*Here are the addresses of the companies mentioned in this article:*

**Kyosho/Great Planes Model Distributors**, P.O. Box 4021, Champaign, IL 61820.

**J.R. Propo Radio**; distributed by Hobby Dynamics, 4105 Fieldstone, Champaign, IL 61821.

**Hobbico/Great Planes Model Distributors**. ■





## TRACK DIRECTORY

In keeping with our constant efforts to help foster the growth of the radio-control car hobby, we've decided to run this track directory intermittently to inform modelers where they can race and exchange ideas. If you'd like your track listed, send us your name, address, phone number and some information about the track to **R/C Car Action Track Directory**, 251 Danbury Road, Wilton, CT 06897. We'll list as many clubs as space allows.

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**SAGUARO WEST RACEWAY**  
West Plaza Shopping Center, Phoenix  
(602) 465-9614

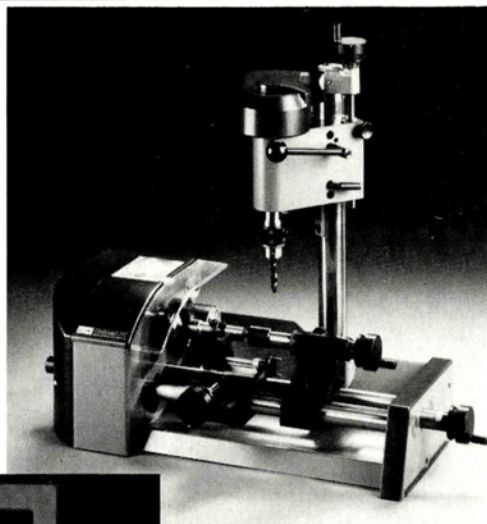
**SCALE RACING SPORTS**  
1120 N. Hayden Rd., Tempe, 85281  
(602) 829-9117

(Continued on page 144)

### conventional

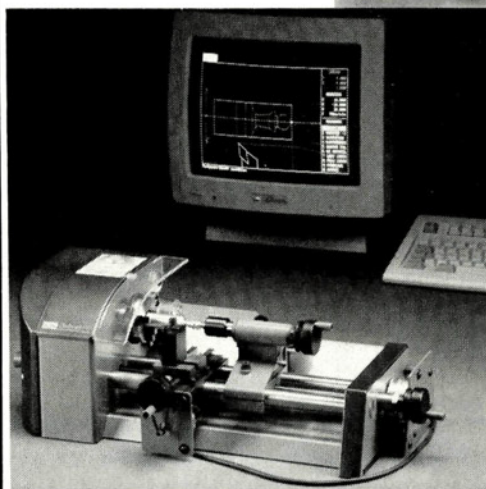
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(Continued from page 142)

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(Continued on page 160)

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(Continued from page 144)

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(Continued on page 164)

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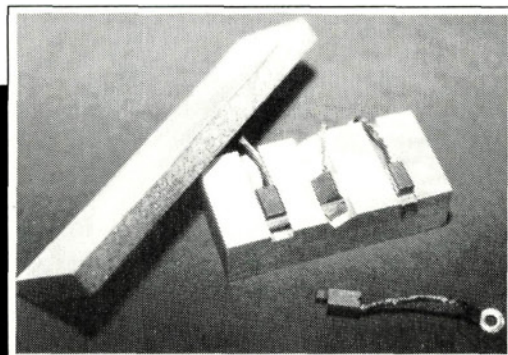
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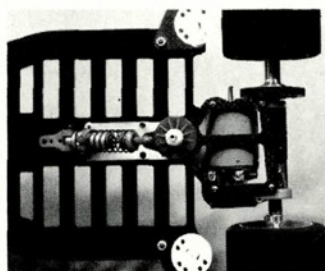
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(Continued from page 165)

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(Continued on page 170)

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# REFLEX CHARGER

## THE LATEST WAVE IN CHARGING

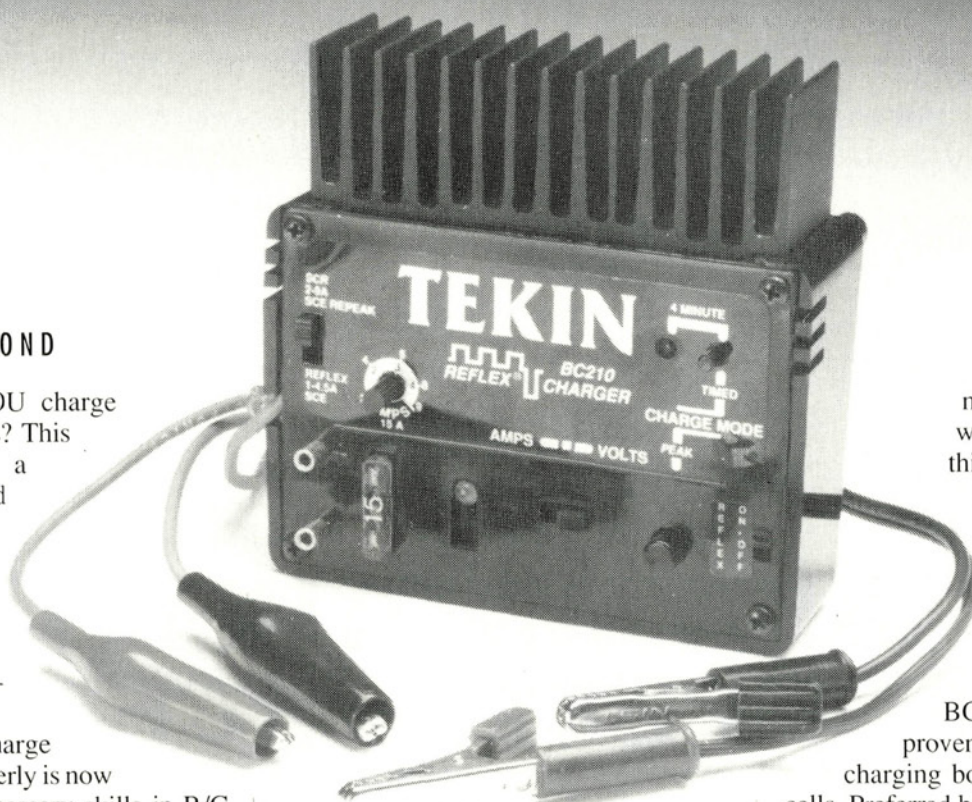
by STEVE POND

**H**OW DO YOU charge your batteries? This sounds like a question that should have a simple answer, but if you asked the 10 most prominent authorities on the subject, you'd hear 10 different answers.

The ability to charge Ni-Cd batteries properly is now one of the most necessary skills in R/C racing, and disagreements about how to do it have increased the sales of many types of charger. In this search for "the ultimate," racers have gone from one charger to another in an attempt to get that extra 10 seconds out of their pack and a win in the A-Main. Charging methods are still very confusing, but we now have a tremendous choice of ways to do it.

While we at *Car Action* haven't given every charger the once-over, occasionally, a new one comes along with new technology that seems to warrant a second look. I'm not referring to one of the "me-too" chargers that does the same thing with a different label, but one that has a new—beneficial—approach to charging. One such charger is the new Tekin\* BC210, which is based on the BC100S soft-pulse charger, but has a few additions that make it worth a second look.

The BC210 could be mistaken for the BC100S because it's mounted in the same



casing. It has

many of the same features:

- 1- to 9-amp adjustable charge rate
- a cell-selector switch for charging both SCRs and SCEs
- output jacks that allow the use of a voltmeter for monitoring charge rate and pack voltage
- an indicator light that shows when the battery is peaked and how it's charging
- fuse-protected circuitry
- a large heat sink for cooling.

What's new?—a new reflex charge mode and a 4-minute timer mode that prevents false peaking.

### REFLEX CHARGING

Reflex charging was originally developed for the movie industry: in remote locations, rechargeable batteries are used for the cameras. After continuous use, it was found that the battery packs ran down to about 75 percent of their capacity when

new. Reflex charging was developed to prevent this deterioration, and this method was able to restore the usable charge to almost 100 percent.

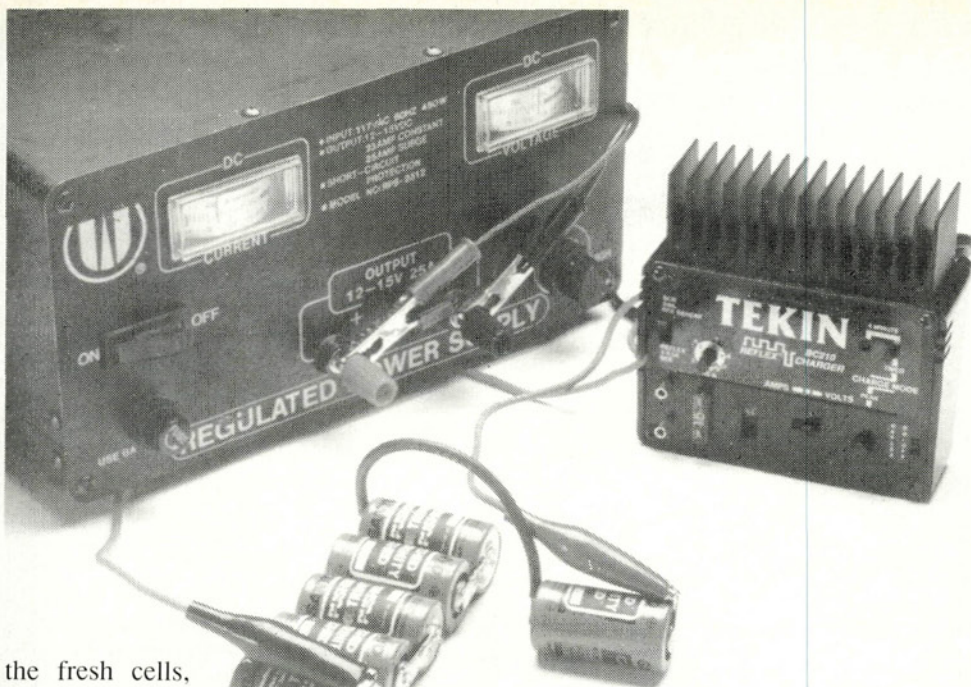
Even without the benefit of the reflex mode, the BC210's soft pulse has proven to be very effective in charging both SCR and SCE-type cells. Preferred by some experts over the linear charge method, the soft pulse seems to give a pack a slightly higher voltage, and this results in faster overall speeds; but it's the effects of the *reflex mode* that make this charger so desirable.

When charging batteries at a low rate and discharging at such a high rate, a crystalline substance forms on the cell plates. This limits the amount of room the cell gases have to expand and results in constantly reduced run time. If you've ever run the same SCE pack a few times in one day, you'll already know of this negative effect on run time. Reflex charging has a series of positive pulses with a single, momentary, negative pulse that breaks down the crystalline substance on the plates and improves run times.

### TESTING TIME

I tested the BC210 with fresh batteries and also with older cells that had lost their "zip" but were still taking a charge. With





*Hooked up to a regulated power supply, a 12V battery, or an automotive battery charger, the Tekin BC210 provides a superior charge for SCEs and SCRs.*

the fresh cells, the temporary crystallization is most likely to occur when the battery

hasn't had enough time to rest between races (a week is usually recommended with SCE cells). Using only two packs a day, I deliberately put at least four charges through each to see if the reflex mode would help to keep them competitive, even after several runs.

Following the instructions, on each of the packs, the first charge was done in the soft-pulse mode. With a brief rest after peaking, I hit the packs with 7 amps for a final peak. Both packs were in the 700 range and turned in consistently fast runs on a flat, carpet oval, with about 40 seconds of run time left at 10 amps (according to a LavCo\* Cell Mate).

That was the easy part. When they had cooled to room temperature, I charged the packs again (usually a big-time taboo in racing circles), but this time, I brought them back up in the reflex mode. Again following instructions, when they were peaked, I switched the charger back to the soft-pulse mode and gave the packs a final shot before heading for the track.

In both cases, the packs were able to equal their previous performance with anywhere from a 5- to 10-second loss (according to the Cell Mate) after the run. Repeated runs in the races that followed yielded similar results. Don't get me wrong; this isn't recommended charging practice, but I wanted to see if the packs would hold up to repeated charges. There's still no real substitute for having enough packs to run each only once a week, but if you're in a jam and you find yourself short one pack for the day, this charge could be the ticket.

A final, less formal, test using older SCE batteries that had been poorly cared for also showed the effects of reflex charging. These batteries had deteriorated to a point where they were only good for practicing. The LavCo numbers on the pack had shrunk from almost 700 to between 630 and 640. This is typical of the SCE cells when they've been used for some time, and there's usually no hope at this point. Using the Reflex Charger, however, I was able to restore the cell's capacity to within 98 percent of its capacity when new. Some packs did better than others, obtaining readings as high as 700 on a pack that read 709 when it was new. In other cases, the improvement was less marked, but there was a substantial increase in run time.

No—the BC210 doesn't have all the bells and whistles; in fact, it's quite the opposite. It's housed in a small, rugged casing that's easy to transport. What else does it do?—nothing. It just charges batteries—and very well, too. The charge is monitored with a digital voltmeter, but apart from that, there's nothing to it.

I highly recommend the Tekin BC210; it combines two proven, effective charge modes that give optimum run time with both SCE and SCR cells. What's more, with a simple, no-frills package, Tekin has kept the cost down and produced a charger that's easy to operate—a definite winner!

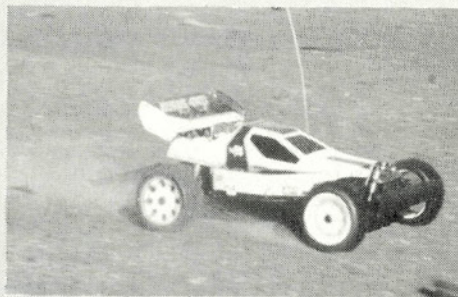
*\*Here are the addresses of the companies mentioned in this article:*

**Tekin Electronics**, 970 Calle Negocio, San Clemente, CA 92672.

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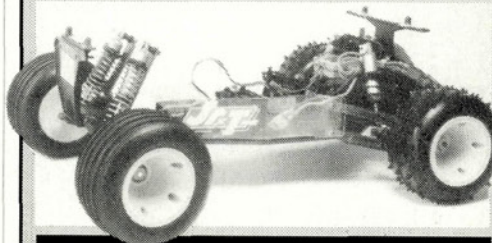


### RACE COVERAGE

**Hot Rod Mag's R/C Nats  
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### FEATURES

**Home-Built Project—Riptide  
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\*Patent No. 4,880,279

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(Continued from page 167)

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Bob Rule (404) 963-0252

#### PDQ RACEWAY

429 Bankhead Hwy., Mableton, 33059

Richard Burdett (404) 941-2626

#### SILVER WINGS SPEEDWAY

5611 Riverdale Rd., College Park 30349

(404) 991-2225

#### GEORGIA HOBBY CENTER

112 Kenwood Rd., Fayetteville 30214

(404) 460-1753

(Continued on page 183)

## BULLET ENTERPRISES

### Computer Matched Batteries

Fun Packs • Sport Packs

Competition Packs

LavCo documented #'s  
at prices you'll love

Call or write for more information:

Bullet Enterprises

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Shoemakersville, PA 19555

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## WALT'S HOBBY

"Call Walt's"

Full line radio control hobby complex  
specializing in friendly, expert service  
for remote control cars and accessories.  
UPS service, discount prices, all major  
credit cards. Two indoor tracks (clay  
and carpet), pulling pit, outdoor track,  
computerized scoring.

2 Dwight Park Dr., Syracuse, NY  
13209. Tel. (315) 453-2291.



# P NORTH COAST PERFORMANCE HOBBIES

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SAT 9a.m. - 5p.m. (EST)  
905 DICKINSON ST.  
FREMONT, OHIO 43420  
FOR INFO STOP OR CALL  
419-334-7721

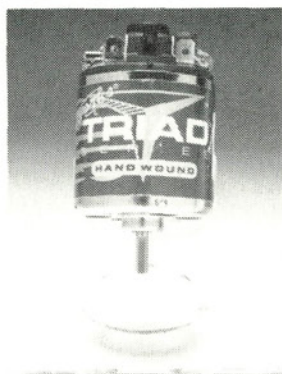
WE ACCEPT M/C & VISA  
ORDERS CALL

800-628-8874

CARS			RADIOS			CHARGERS		
ASC6010	RC10 W/		FUTJ08	2PB AM/148s	58.99	CEI10	Turbo CHgr	199.99
	Bushings	123.99	FUTJ10	2PB AM/112	89.99	CEI12	Linear Turbo	239.99
ASC6016	RC10 W/ball		FUTJ02	Junior/148	83.99	TEK20	BC100S Soft	79.99
	bearings	161.99	FUTJ01	Junior/132H	109.99	<b>BATTERIES</b>		
ASC8001	RC10L on rd		FUTK05	Mag AM/132H	139.99	Team Smooth Comp/		
	fiberglass	98.99	FUTJ29	PCM 132H	240.99	or Team Packs		
ASC8002	RC10L Grhp	138.99	FUTJ27	PCM 9301	264.99	7.2v flat packs		
ASC4301	12L Basic	69.99	<b>SPEED CONTROLS</b>			Shipping & Handling \$5.00		
ASC4302	12L Grhp	121.99	TEK300	Pro 300	69.99	Add \$3.50 for all C.O.D.		
ASCYZ10	Yokomo YZ10	225.99	TEK600	Pro 600	99.99	Personal Chks held 2/wks		
TML0001	JRx2 car	159.99	NOV1425	T4 esc	69.99	To Clear.		
TML0011	JRxT truck	193.99	NOV1125	T1 esc	106.99	Ohio Residents add 6.5%		
KYO0001	Ultima Pro	179.99	DRP0022	Dialed esc	99.99	sales tax.		



# WHAT'S NEW

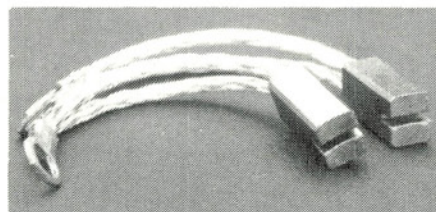


## TRINITY

### Speedworks Triad Motors

Here's a new series of wet-magnet, hand-wound modified motors based on the popular Speedworks can, magnets and end bell. These motors are available with 9- to 13-turn armatures, each of which is hand-wound and features welded tabs for lower resistance, a diamond-trued commutator, a high-temperature thermal coating on the windings, the latest 4.0 two-stage wet magnets and the Speedworks end bell, which is made of a high-temperature composite material that eliminates meltdowns.

Price: \$59.99



### Slotted Dual Brush

Designed for today's motors, this new brush has dual shunts for the lowest resistance, a new non-glazing formula, and a slotted face for less arcing and heat build-up while still allowing better brush-to-commutator contact. These are the only brushes that allow the hot 8- to 14-turn motors to reach their potential performance.

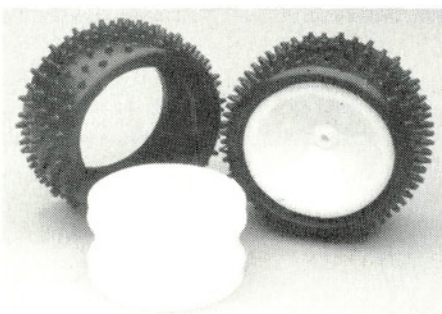
Price: \$3.50/pair



## Speedworks Superspeedway Stock

The banks of the legendary Lake Whippoorwill Superspeedway were the development area for Trinity's outrageous new 23-turn stock motor. Designed for outstanding performance, the new Superspeedway stock motor features high-density ceramic magnets, precision Oilite bushings, and 8 degrees timing to push the motor to 27,000rpm.

Price: \$28

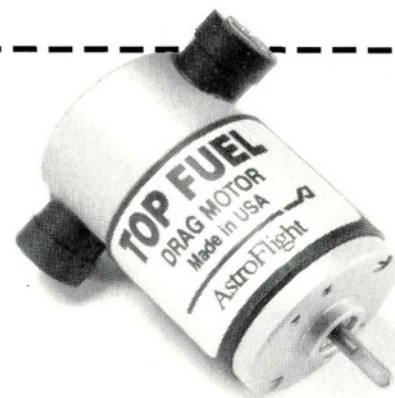


## 2.2-Inch Tires & Rims

You've heard all the talk about the 2.2-inch-diameter rear wheels and tires used at the Off-Road World Championships? Now "Worlds-style" tires are available to everyone! Trinity's awesome high-bite tires are made of natural rubber in two compounds and two spike patterns to suit most tracks. Available for the JR-X2, the RC10 and the Ultima.

Price: \$6.99 (wheels); \$9.99 (tires)

For more information, contact Trinity Products, Inc., 1901 E. Linden Ave., Linden, NJ 07036.



## TEAM ASTRO Top Fuel Motor

Team Astro's Top Fuel Drag motor holds a world record with a run of 132 feet in 1.96 seconds! The motor has six turns of 19-gauge wire wrapped on a seven-slot skewed armature. Unlike other motors, the Top Fuel is designed to run on 10 to 14 cells at 48,000rpm. It has 10 samarium-cobalt magnet segments, a rugged .440-inch-diameter commutator and heavy-duty brushes.

Price: \$99.95



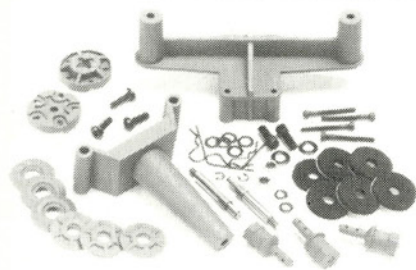
## Pull Master Motor

With pulls of up to 350 pounds, the new Pull Master has already captured records all over the world. It has 10 powerful samarium-cobalt magnet segments in a precision-machined modular can. With 12 turns of 22-gauge wire wrapped on the seven-slot skewed armature, the Pull Master produces massive torque at a gearbox savings of 19,000rpm.

Price: \$89.95

For more information, contact Astro Flight, 13311 Beach Ave., Marina Del Rey, CA 90292.





### CRP

#### Monster Truck Conversion

This basic monster truck conversion kit for the RC10 contains replacement front axles and new rear hubs to modify Tamiya-style truck wheels and tires, and all necessary hardware, including body posts, to transform your RC10 into a monster truck.

Part no. 1562

Price: \$29.99



### Body Mounts

These new body mounts can be combined with existing monster truck kits, or they can be used to mount truck bodies on your Kyosho Ultima. They're designed to fit existing chassis holes, so they don't need other custom parts or modifications.

Part no. 1716

Price: \$8.99

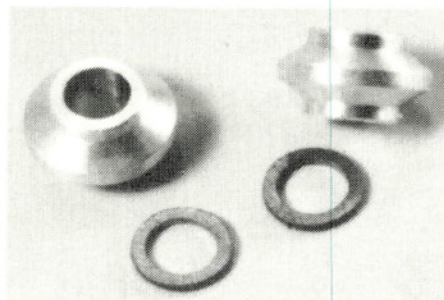


### FRONT STUB AXLE

These front stub axles are designed to convert the Ultima or the Turbo Ultima to a monster truck. The stub axles allow you to mount CRP4125 with CRP4208/4209 tires or stock Blackfoot/Monster Beetle tires on the Ultima. Use them with the CRP1715 wheel adapter, and mount them with 5x11 bearings.

Part No. 1714. Price: \$9.99.

For more information, contact Custom Racing Products, 3250 El Camino Real #B3, Atascadero, CA 93422.

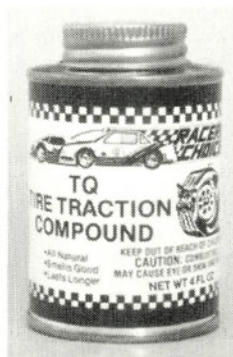


### BUD'S RACING Crush Sleeves

These Crush Sleeves fit inside your front wheels between the ball bearings. When the axle nut is tightened, the inner races of the bearings are "snugged up" against the Crush Sleeves to keep the bearings perfectly aligned. This not only eliminates front-wheel end-play, but it also eliminates the play between the inner race of the bearing and the stub axle, and this helps to prevent uneven tire wear. Available for either 1/8-inch or 3/16-inch axles.

Price: \$3.50 to \$3.95

For more information, contact Bud's Racing Products, 52435 Route 113, Dept. RCCA, Wakeman, OH 44889.

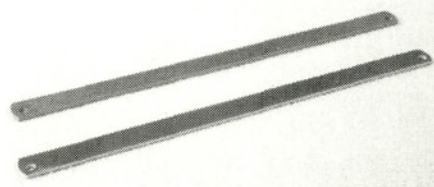


### RACER'S CHOICE Traction Compound

Racer's Choice now offers a new, improved TQ Tire Traction Compound that's formulated for use on the heavier-transmission off-road cars like the RC10 and the JR-X2. Unlike other traction compounds, it's made of natural ingredients and has a refreshing, harmless, lemon-orange fragrance. Many pro racers who have tried TQ say it provides ultimate acceleration and great control. It's ideal for almost every racing surface where foam tires are used; and it offers the additional benefits of reducing tire wear and even reconditioning and softening old tires. For best results, TQ should be applied for 30 to 45 minutes and rubbed into the foam tires.

Price: \$6.50

For more information, contact Racer's Choice R/C Products, Inc., P.O. Box 405, Medinah, IL 60157.



### BOLINK Kingpin Braces

The Eliminator 10 front kingpin brace comes in fiberglass or graphite. The brace strengthens the front end, improves the steering and helps the tires to wear more evenly.

Part nos. BL-5192 (fiberglass); BL-5192-A (graphite)

Price: \$3.95; \$13.95.

For more information, contact Bolink R/C Cars, Inc., 420 Hosea Rd., Lawrenceville, GA 30245.

(Continued on page 174)



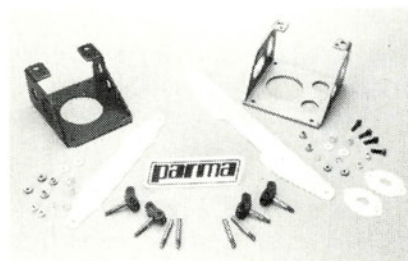
# WHAT'S NEW



## PARMA Spur Gears

Parma unveils its 64-pitch spur gears. Molded of tough nylon composite, they come in white, but can be dyed any color. An exclusive drive-ring carrier/grease pocket design allows for smooth differential operation; also unique are the sizes offered: 98-, 102-, 106- and 110-tooth.

Price: \$4



## Scratch Kits

Parma offers scratch-building kits for fans of 1/10- and 1/12-scale R/C cars. These kits contain all the basic parts you'll need to start your next project, including rear pod, front crossbeam, kingpins, axles and bushings, ride height and adjusters (1/10 scale only) and hardware.

Price: \$13 to \$15



## Chevy Lumina

NASCAR fans: brand-new from Parma is the 1/10-scale '89 Chevy Lumina Lexan body for on-road fans.

It has typical Parma style and striking detail.

Price: \$19

For more information, contact Parma International, 13927 Progress Pkwy., N. Royalton, OH 44133.



## ASSOCIATED ELECTRICS New Reedy Motors

To meet the ever-increasing demands for horsepower, here are two, hot, high-performance winds from Reedy modified motors. The Ultra Series Blue Dot is a 12-turn motor designed for 1/10-scale, 6-cell, 2WD on-road oval racing as well as 2WD and 4WD dirt-oval racing. The Ultra Series Green Dot motor is designed for 4WD cars on high-speed tracks and for all forms of oval racing.

Price: \$80 each

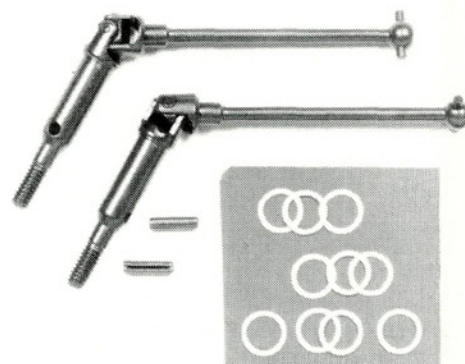


## Graphite Chassis

For years, racers have been modifying their RC10s by using the light graphite chassis; now, Team Associated has introduced its own replacement chassis. Included as factory equipment on the new RC10 Graphite, this light chassis is extremely rigid. Whether it's used as a replacement for the RC10 Graphite or as a modification for the RC10 or the TQ10, the fit will be one that only a factory part can provide.

Price: \$65

For more information, contact Associated Electrics, Inc., 3585 Cadillac Ave., Costa Mesa, CA 92926.

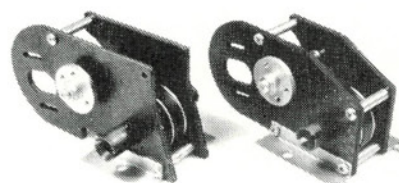


## Universal Dogbone

This rear universal dogbone/stub-axle combination permits free suspension movement during acceleration. It includes pins and precision shims for accurate alignment from transmission to hub carrier, and it fits the RC10, the RC10 Graphite and the TQ 10.

Price: \$30

For more information, contact Associated Electrics, Inc., 3585 Cadillac Ave., Costa Mesa, CA 92926.



## TRACK MASTER Turbo Glide

Track Master's Turbo Glide belt-drive transmission is a proven winner. In its testing stages, the Turbo Glide has TQ'd and won local, regional and national events. This 1/5-inch-pitch belt-drive transmission has a fully adjustable ball differential, and mid or rear engine mounting. It's available for the RC10 and the Ultima, with either aluminum or graphite side plates.

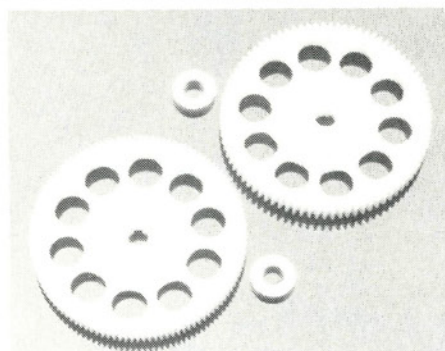
Price: \$119.95 to 139.95

For more information, contact Track Master, 1466 Pioneer Hwy. #10, El Cajon, CA 92020.

(Continued on page 176)



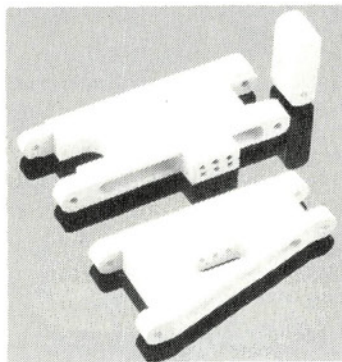
# WHAT'S NEW



## ROBINSON RACING JR-X2 Spur Gears

Robinson Racing now offers 48- and 64-pitch precision-machined replacement gears for the Team Losi JR-X2. Made with the same attention to quality as its World Champion winning gears, these machined spurs have a snap-on design that doesn't require an adapter. The 48-pitch gears are available in 72, 75, 78, 81, 85, 87, 90 and 93-tooth sizes. The 64-pitch gears are available in 96, 100, 108, 115, 120 and 125-tooth sizes.

Price: \$8.50



## JR-XT Trucker

These new front and rear A-arms will max-out the width of your JR-XT to the full 13-inch legal limit. These A-arms are light and machined from solid stock in a box configuration. Their rigidity improves suspension geometry by eliminating flexing.

Part nos. 8502 (front); 8503 (rear)

Price: \$27/pair

For more information, contact Robinson Racing Products, 165 N. Malena Dr., Orange, CA 92669.



## PRO-LINE Monster Conversions

Pro-Line provides one of the most complete monster truck conversions available for competition 2WD cars. Available for the Ultima, the RC10 and the JR-X2, these conversions include a heavy-duty truck body; heavy-duty hardware; wheels that can be dyed; and competition knobby tires that are ideal for most racing surfaces. Pro-Line includes its own "neon" monster truck decal in every kit.

Price: \$39.95 to 79.95

For more information, contact Pro-Line, P.O. Box 456, Beaumont, CA, 92223.

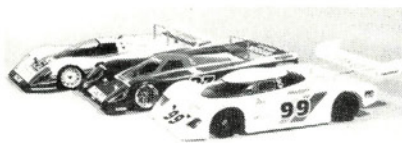


## McALLISTER RACING Barracuda

The 1970 Barracuda is available from McAllister Racing. This classic from the muscle-car era features one of many Mopar, mega-horsepower, big-block engines and is still very much sought after. The 'Cuda is now available for your 1/10-scale R/C car.

Part no. B-134

Price: \$20



## GTP Bodies

If you intend to keep score in 1990, you'll only need to know three names in GTP: Jaguar, Nissan and Toyota.

McAllister Racing has all three bodies in 1/10 scale. Each is molded of polycarbonate, which can be painted from the inside to produce a flawless exterior. The bodies show great attention to scale.

Part nos: B-123 (Jaguar); B-116 (Nissan); B-133 (Toyota)

Price: \$20

For more information, contact McAllister Racing, 2245 First St., Unit 105, Simi Valley, CA 93065.



## PARAGON Formula 1 Motor Bath

A superior blend of high-quality products, Formula 1 Motor Bath is the choice of discerning racers. It's formulated to clean particles and brush deposits off your motor, thus improving its performance. This pourable version of the Formula 1 allows you to submerge the motor completely for better cleaning than is possible with a spray. It's also fantastic for cleaning bearings. Look for Formula 1 in the bright, new can with the convenient no-drip, flip-top cap.

Price: \$6.95

For more information, contact Paragon Racing Products, Dept. CA2, 690 Industrial Circle So., Shakopee, MN 55379.

(Continued on page 178)



# WHAT'S NEW

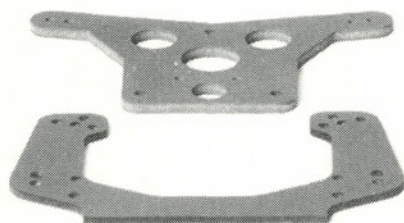


## WHEELER INDUSTRIES Solar Visor

The advanced Solar Visor is designed to block almost all annoying sunlight. A polarizing lens material extends from the cap's bill at an angle and wraps around both sides. This protects the front and sides of the face from the direct rays of the sun. In addition, the angle of the lens gives increased protection from reflected glare, and the entire Solar Visor line can be worn over prescription eyeglasses. It's available in black, red, green, light blue and dark blue.

Price: \$12.95 to \$14.95

For more information, contact Robert Wheeler Industries, Inc., 823A East Gulf Blvd., Indiana Rocks Beach, FL 34635.



## BULLET RACING Shock Towers

Bullet Racing offers graphite replacement shock towers for the fiberglass ones that are included with the RC10 Graphite, and they can also be used on the original RC10s using longer, after-market A-arms. Use the Bullet shock tower to relocate the upper control link and (when combined with the longer arms) to control bump-steer.

Part no. 1104

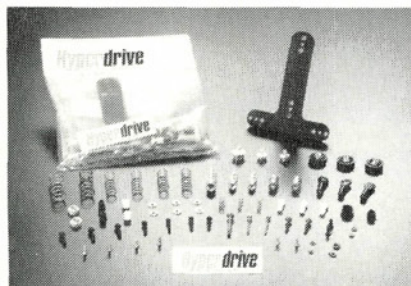
Price: \$14.95



## Aluminum Wheels

Bullet Racing has a complete line of aluminum wheels, titanium dogbones and axles, and other machined products for on- and off-road R/C cars and trucks.

For more information, contact Bullet Racing Products, Inc., 14435 Tomball Pkwy., Houston, TX 77086.



## HYPERDRIVE RACING Sport Suspension Kit

The kit allows you to bolt-on the competition-proven Hyper 10 three-shock, ball-pivot suspension directly. This kit consists of three mono-ball sets, one T-plate; six flat-head screws; two side shock mounts; two small shocks; one large shock; three 4-40x4-40 Heim joints; three ball sockets; four 4-40x1/2 socket-head capscrews; two 4-40x1/4 button heads; six no. 4 washers; two 4-40x5/8 flat-head screws; and three 5-40x1/2 socket-head capscrews.

Part no. HY 2001

Price: \$119.95



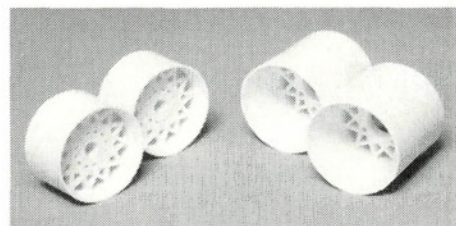
## Hypergraphics

Show the competition what it's up against with Hyperdrive Racing's new, high-quality, pressure-sensitive Hyperball and Hyperdrive decals in various sizes and colors.

Part nos. AC0100; AC0101

Price: \$4.95.

For more information, contact Hyperdrive Racing Systems, Inc., 3210 Howard Nickell Rd., Fayetteville, AR 72703.



## TWINN-K BBS Rims

New, bold, bright, beautiful colors! If you like to stand out from the crowd, here are Twinn-K's top-selling BBS rims in seven hot, new colors (copper, black, yellow, orange, green, blue, tangerine red). Packaged in sets (one front pair; one rear pair), they're perfect for mixing and matching. Adapters are available in the same bright colors to mix or match.

Price: \$12.90/set; adapters, \$4.50/pair

For more information, contact Twinn-K Inc., P.O. Box 31228, Indianapolis, IN 46231.

Descriptions of new products appearing on these pages were derived from press releases supplied by the manufacturers and/or their advertising agencies. The information given here does not constitute endorsement by Radio Control Car Action, nor guarantee product performance or safety. When writing to the manufacturer about any product described here, be sure to mention that you read about it in Radio Control Car Action.



# TRACK DIRECTORY

(Continued from page 170)

## HAWAII

**HAWAII R/C ELECTRIC CAR CLUB**  
1423-10th Ave., Honolulu, 96816  
(808) 737-9582

## COBRA

P.O. Box 27908, Honolulu, 96827  
(808) 538-7255

## IDAHO

**VAROOM-VENTURE RACEWAY**  
4th & Bryden, Lewiston, 83501  
(208) 743-4141

## ILLINOIS

**CARPETBURNERS R/C CLUB**  
436 E. Main St. (rear), Danville, 61832  
(217) 442-7466

**METRO FAST RACEWAY**  
950 W. Irving Park Rd., Hanover Park, 60103  
(312) 213-3977

**WEP ELECTRONICS & HOBBIES**  
Rt #2, Box 59, Lawrenceville, 62439  
Bill Poe (618) 884-9048

**LANE HOBBY MODELS**  
Lane Plaza Mall, 2550 W. Addison, Chicago, 60618  
(312) 477-3050

**RACEWAY HOBBIES, LTD.**  
80 E. Main St., Rt. 22 Lake Zurich, 60047  
Bill Palermo (312) 438-0460

**HOBBYTOWN**  
4915 W. Rte. 120, McHenry, 60050  
Luke Herring (815) 344-1777

**S. SUBURBAN R/C CAR CLUB**  
510 Ingraham, Calumet City, 60409  
(312) 891-0089/474-7802

**BYRON AREA RADIO RACERS**  
800 River Dr., Byron  
Jim Haynes (815) 234-5615  
or Bob Falk (815) 234-5183

**TEEN TOWN**  
105 N. 13th, Herrin

**MARTY'S R.C. HOBBIES**  
1335 E. Broadway, Bradley, 60915  
(815) 933-8441

**CHICAGOLAND HOBBY**  
6017 Northwest Hwy., Chicago, 60631  
Greg (312) 775-4848

**HOBBY HUT**  
22 Nameoki Vil., Granite City, 62040  
Roy Koberna (618) 451-7330

**THUNDER ROAD 31 RACEWAY**  
3603 Richmond Rd., McHenry, 60050  
Vern, Jim or Steve (815) 344-2277

**MACHESNEY PARK RACEWAY HOBBIES**  
1220 Shappert Drive, Machesney Park, 61111  
Jack & Georgia Henricks (815) 282-1311

**S.T.O.R.M. RACING SERIES**  
P.O. Box 925, Franklin Ave.,  
Franklin Park, 60131

**LANE HOBBY MODELS**  
Lane Plaza Mall  
2550 W. Addison, Chicago, 60618  
Jack (312) 477-3050

**HOBBY CORNER RACEWAY**  
2195 E. Garfield, Decatur, 62526-5124  
(217) 429-4477/4577

## INDIANA

**SOUTHERN INDIANA MODEL RACING ASSOC.**  
Copay Hobby Center  
413 Oolitic Rd., Bedford, 47421  
(812) 275-7568

**CC HOBBY & SPEEDWAY**  
R.R. 1, Box 68, Francesville, 47946  
(219) 567-2447

**WILDWOOD ACRES CAMPGROUND**  
0520W, 300N, Hartford City, 47348  
Don Bole (317) 348-2100

**HOBBY CONNECTION RACEWAY**  
925 N. Lynhurst, Indianapolis, 46224  
Carl Gilbert (317) 247-5702

**BREMEN BANDITS R/C RACING CLUB**  
BREMEN HOBBIES  
308 N. Bowen, Bremen, 46506

**GONZO RACEWAY**  
Chesterton, IN Jeff (219) 926-4341/736-7414

**GOSHEN R/C OFF-ROAD RACING**  
Tim's Hobby Shop, 1922 Elkhart Rd.,  
Goshen, 46526  
(219) 534-1992

**MIDDLEBURY R/C CLUB**  
Flying High Hobbies Haus,  
304-A N. Main, Middlebury  
Steve or Sharon Mattern  
(219) 825-2128

**TRI-COUNTY RACEWAY & HOBBIES**  
Rt. 4 Hwy 50E, Washington, 47501

**EAGLE HOBBIES**  
24968-A C.R. 6, Elkhart, 46514  
Pat/Kathy Sapikowski (219) 262-2066

**KOKOMO HOBBY & RADIO**  
RACETRACK  
1704 E. Sycamore, Kokomo, 46901  
(317) 457-5060

**RUSHEL OUTLAW DIRT OVAL**  
Rte. #4, Rushville  
Steve Shoppelle (317) 932-3407

**MAIN HOBBIES**  
625 Columbia St., LaFayette 47901  
(317) 742-2045

## IOWA

**IOWA OFF-ROAD RACING CLUB**  
P.O. Box 22052, Des Moines, 50322  
Ron Boone (515) 987-1184

**IOWA RADIO OPERATED RACERS**  
421-26th St., Marion, 52302 Bill Wright

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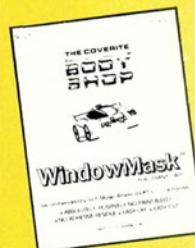
**"...and here  
are the press-  
ons I use."**

— Rich Muise



## BODYSHOP WINDOWMASK

"Instead of cutting strips from rolls, I cut the whole window from the 6" x 12½" Window-Mask. Enough for a whole car. BodyShop paint never leaks under it."



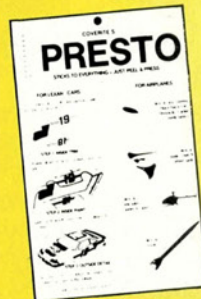
## BODYSHOP PINSTRIPES

"These stripes are the best. They stay down even on 90° angles. Each sheet has 5 sizes, total 50 ft. 7 colors."



## PRESTO TRIMSHEETS

"I cut out logos, gas caps, racing numbers, bumpers. Stick 'em inside or out. 6" x 12½" sheets. Enough for several cars. 9 colors including real metal flakes."



## GRAPHICS STARS, ETC.

"Each star is diecut, so you just peel'n press. Stars in 4 sizes, 62 per sheet. Also ¼" & ½" numbers & letters on 1 sheet. 5 colors."



**THE COVERITE  
BODY  
SHOP**

420 Babylon Road, Horsham, PA 19044



**NEW!**

## PURE-TECH P-7 RACING BEARINGS

- Teflon sealed, frictionless, maintenance free
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(Continued from page 183)

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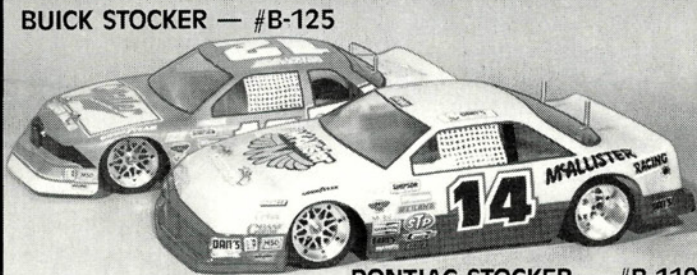
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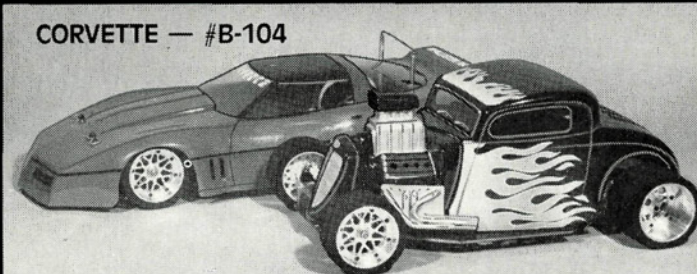
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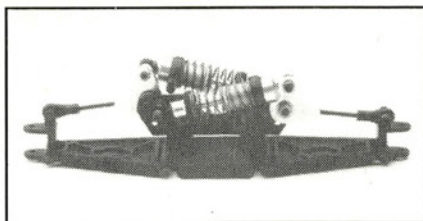




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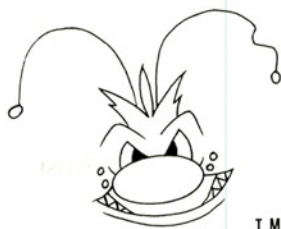
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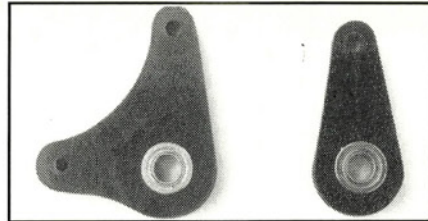


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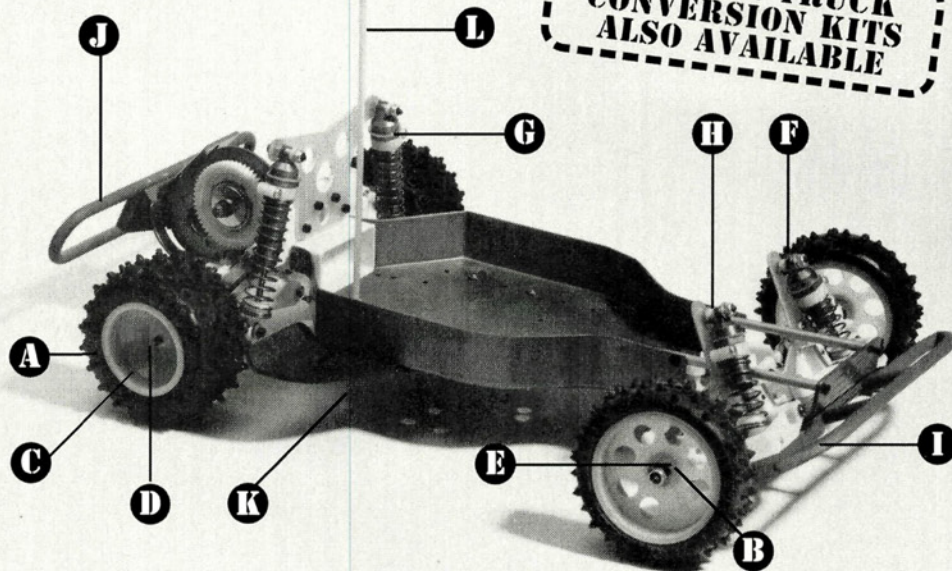
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(Continued from page 193)

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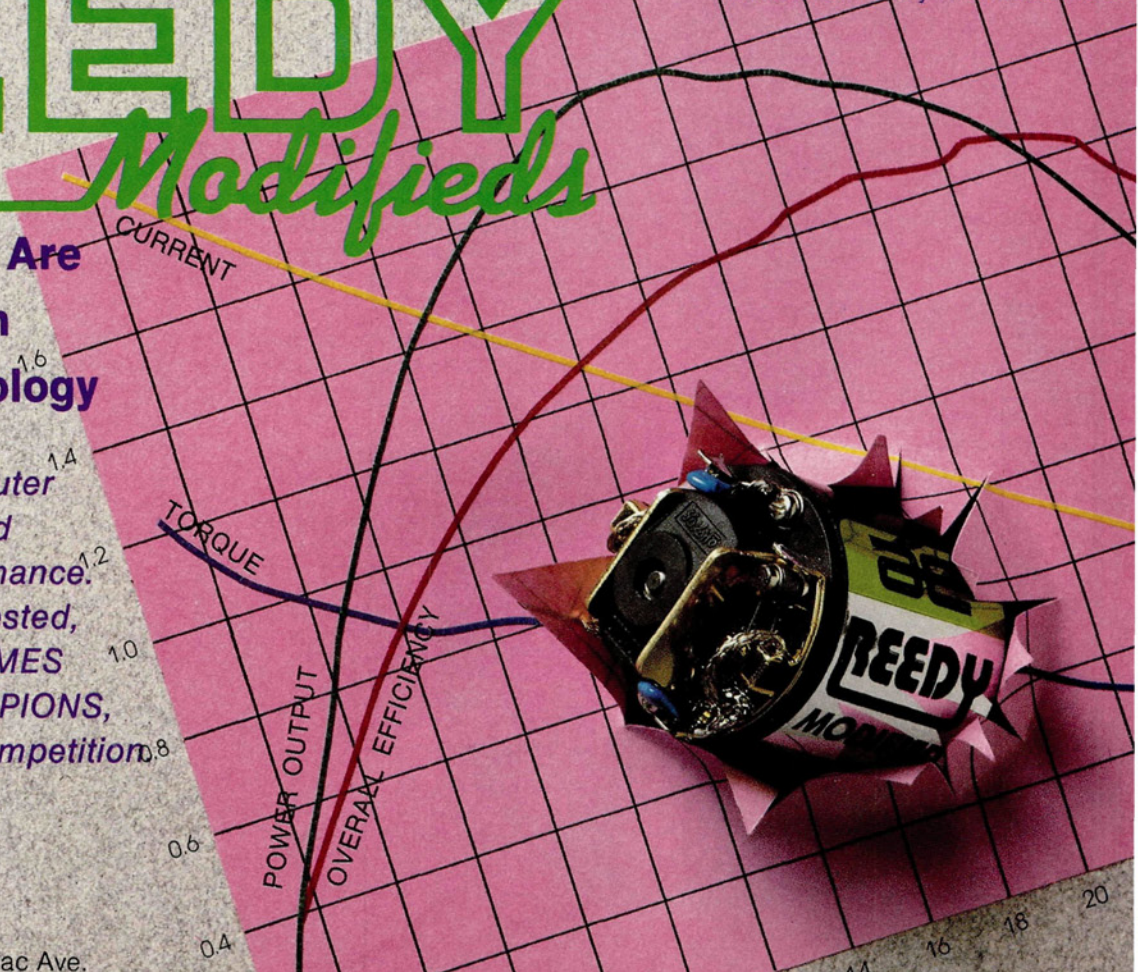


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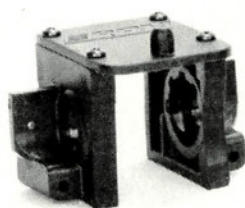
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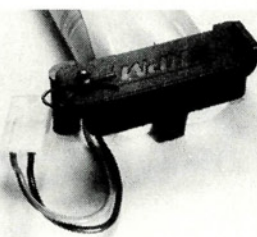
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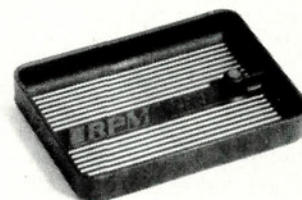
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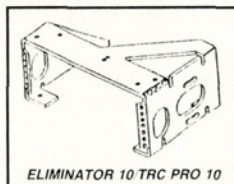
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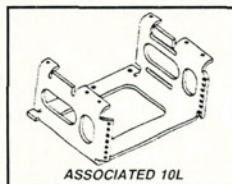
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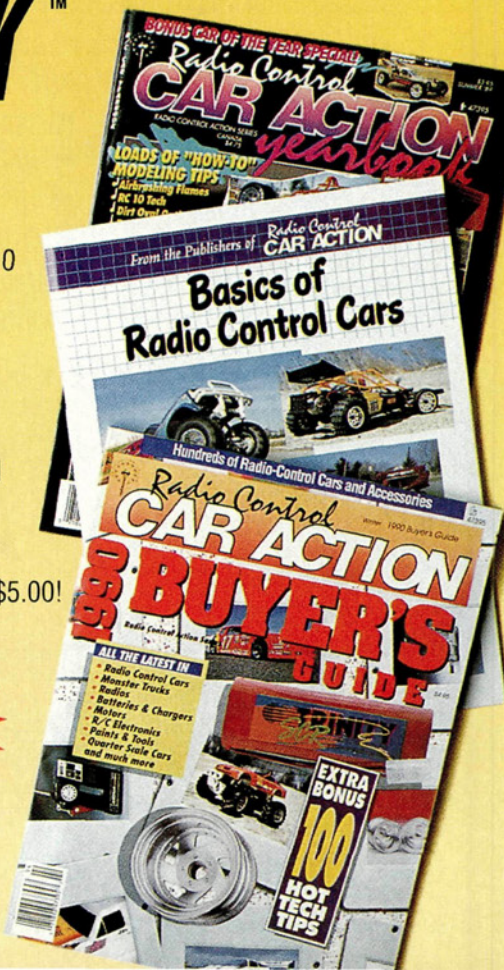
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\*Potential track; if interested call  
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(Continued on page 215)

## THE IMPOSSIBLE TWO SECOND BARRIER HAS BEEN SHATTERED

The Team Astro Top Fuel Drag Motor keeps breaking IEDA international drag racing records from coast to coast. The two second barrier is just the beginning.

### AWESOME ACCELERATION

The Astro Top Fuel Cobalt motor delivers AWESOME ACCELERATION! Ten super power cobalt magnets deliver unequaled TORQUE. Unlike wet magnets, our Cobalt magnets will never become demagnetised... no matter how much you abuse this motor. Our oversize commutator,



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See Your hobby dealer TODAY and ask for Your Team Astro Top Fuel Cobalt Motor!

### FLASH

Colton, CA: January 1990

Mike Hogue wins IEDAWinter Nationals  
Has 1.91-second run with his Astro Top Fuel II-powered Hogue Illusion.

# TAKE NO PRISONERS

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(Continued from page 212)

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### NY 500 OFF-ROAD RACE TRACK

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(Continued on page 216)

# Stop Paying Too Much For Batteries

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Matched 6 cells 470+ **\$25** each  
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NEW! East Coast stock motors **\$22.00**

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Cooper's R/C, Callands, VA /Ray Turner (2-16-89)

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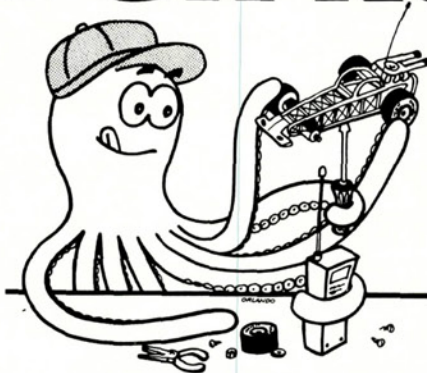
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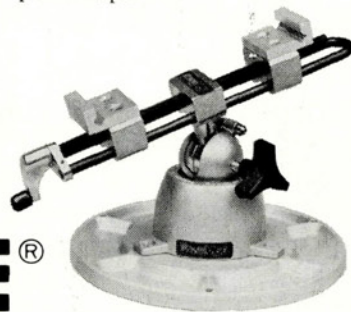
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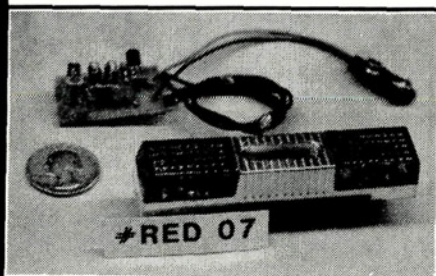
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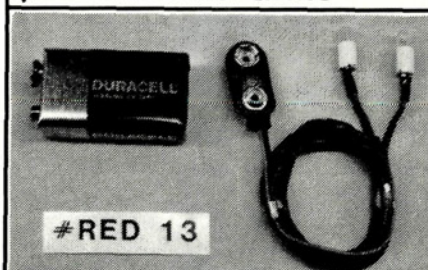
The **#RED 13 Headlights** now let you use our high quality, ¼" base RAM instrument bulbs in molded grills.

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## HEADLIGHTS for Tamiya etc. NEW Molded Grills



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(Continued from page 215)

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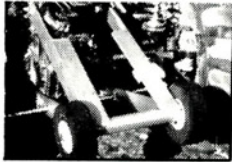
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(Continued from page 216)

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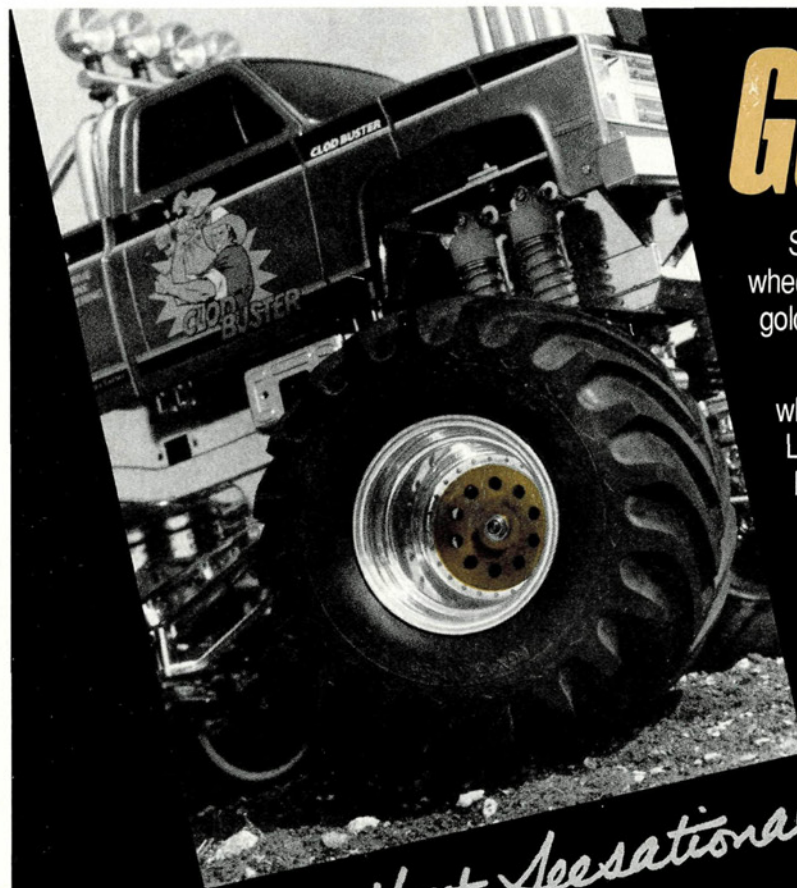
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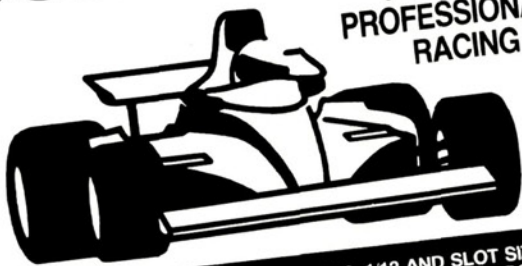
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(Continued from page 218)

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| D | Chassis Mount Antenna | 3021 |
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|---|-----------------------------|------|
| E | Heavy-Duty Steering         | 1604 |
| F | Front Steering Arms, Tamiya | 1621 |

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|---|-------------------|------|
| G | Rear Axle Springs | 1547 |
| H | Front Shock Kit   | 1556 |

### MOTOR ACCESSORIES

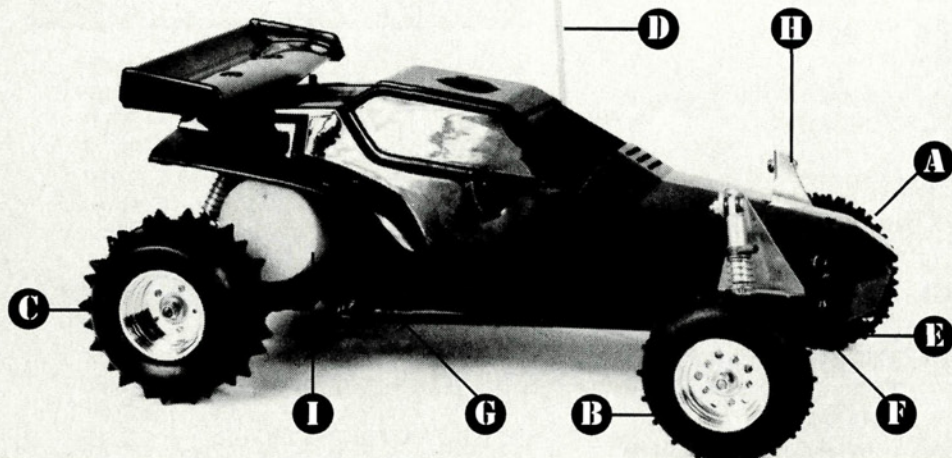
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| I | Motor End Bell cover, Foam | 2158 |
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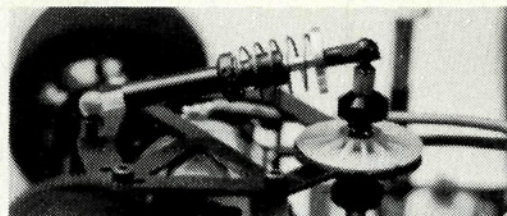


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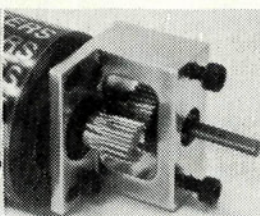
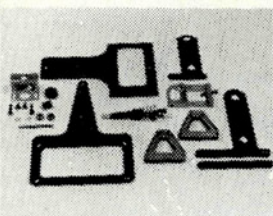
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